Amended Site-Specific Health & Safety Plan (HASP) for Southeast Rockford Groundwater Contamination Superfund Site Remedial Design Area 9/10

Hamilton Sundstrand - Plant 1
2421 11th Street
Rockford, Illinois 61104

Prepared for: **Hamilton Sundstrand**

Prepared by:

013
446 Eisenhower Lane North
Lombard, IL 60148

03/30/07

SECOR
HEALTH AND SAFETY PLAN
REVIEW AND APPROVAL

CLIENT: Hamilton Sundstrand	SITE NAME: Plant 1
PROJECT NAME: SER RD Design	PROJECT NUMBER: *13UN.02072.04*
START DATE: 8/1/2007	END DATE: 3/31/2008
PLAN REVIEW DATE: 2/1/2008 12:00:00 AM (Last day of expected fieldwork or no longer than 6 months).	

John Puckett Task Manager	Signature: [signature]	Date: 3/30/07
David Vasquez SECOR Office Health and Safety Coordinator	Signature: [signature]	Date: 3/30/07
Christopher Armes Site Health and Safety Officer	Signature: [signature] (for Chris Armes)	Date: 3-30-07
Keith Wilcoxson SECOR Office Operations and Project Manager	Signature: [signature]	Date: 3/30/07
George Cartwright Peer Reviewer	Signature: [signature]	Date: 3-30-07

This Health and Safety Plan has been written for the use of SECOR and its employees. It may also be used as a guidance document by properly trained and experienced SECOR subcontractors and clients.

Our work can be hazardous, and it is imperative that we never forget that! It is the intent of this document to address our risks. The health and safety guidelines in this Plan were prepared specifically for this site, its conditions, purposes, dates and personnel and must be amended if conditions change. This Plan must not be used on any other site without prior research by trained health and safety specialists.

SECOR claims no responsibility for its use by others for purposes unrelated to this project. This Plan will provide useful information to subcontractors and will assist them in developing their own HASP. Subcontractors should sign this plan (See **Attachment 12**) as an acknowledgement of hazard information and notice that they must ensure that the risks posed by work on this site are addressed. SECOR is readily available to assist subcontractors in identifying and addressing their employees' risks.

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ATTACHMENTS

1.0 LOCAL EMERGENCY CONTACT NAMES, PHONE NUMBERS, AND DIRECTIONS TO THE HOSPITAL

The nearest telephone is a: Cell Phone - Personal cell phone carried by the SECOR SHSO.

	NAME	TELEPHONE	VERIFIED
Hospital	**Swedish American Hospital 1401 East State Street Rockford, IL 61104**	**(815) 962-2679**	YES
Ambulance	**Lifeline Ambulance Service**	**911 OR, (815) 399-3313**	YES
Police	**Rockford Police Department**	**911 OR, (815) 987-5800**	YES
Fire Department	**Rockford Fire Department**	**911 OR, (815) 987-5800**	YES
SECOR	**SECOR Lombard Office**	**(630) 792-1680**	YES

DIRECTIONS

1. Start out going north on **11th Street** toward **23rd Street** **(1.5 miles)**
2. Turn left on **Charles Street** **(0.2 miles)**
3. Turn right on **9th Street** **(0.2 miles)**
4. Turn right on **East State Street/HWY 20** **(0.1 miles)**

Distance: 2.27 miles
Approximate Travel Time: 7 minutes

MAPQUEST

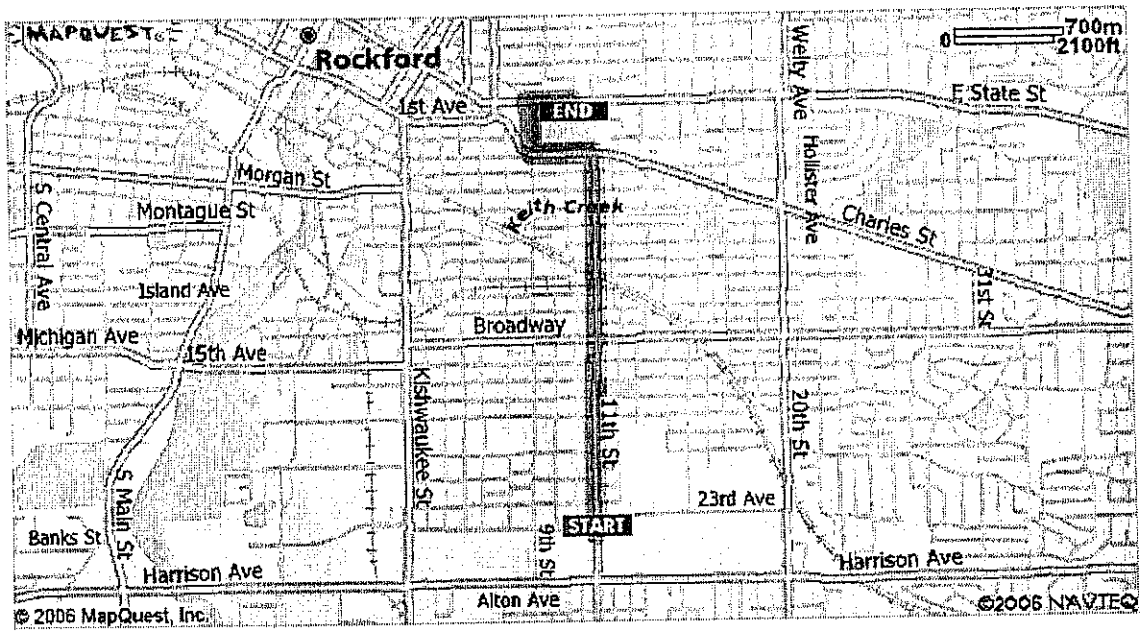
Start: **2421 11th St**
Rockford, IL 61104-7217, US

End: **1401 E State St**
Rockford, IL 61104-2315, US

Notes:

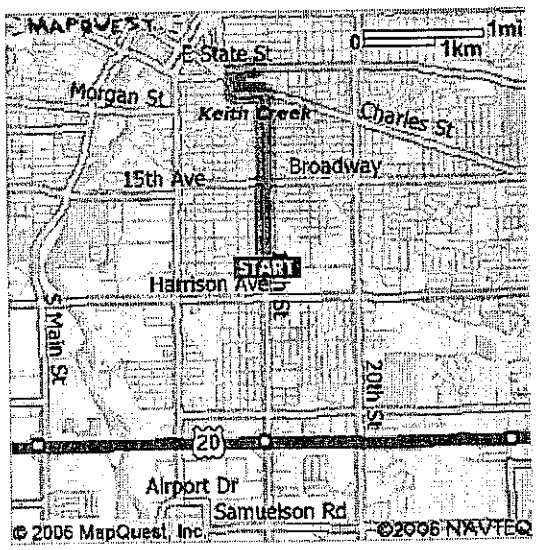
Directions	Distance
Total Est. Time: 7 minutes **Total Est. Distance:** 2.27 miles	
START **1:** Start out going NORTH on 11TH ST toward 23RD AVE.	1.5 miles
2: Turn LEFT onto CHARLES ST.	0.2 miles
3: Turn RIGHT onto 9TH ST.	0.2 miles
4: Turn RIGHT onto E STATE ST / US-20 BR.	0.1 miles
END **5:** End at **1401 E State St** Rockford, IL 61104-2315, US	
Total Est. Time: 7 minutes **Total Est. Distance:** 2.27 miles	

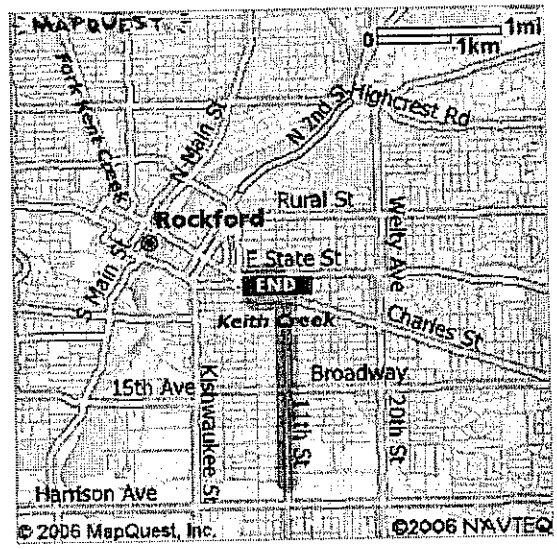
ORBITZ Map out great hotel rates on Orbitz



Start:
2421 11th St
Rockford, IL 61104-7217, US

End:
1401 E State St
Rockford, IL 61104-2315, US





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These directions are informational only. No representation is made or warranty given as to their content, road conditions or route usability or expeditiousness. User assumes all risk of use. MapQuest and its suppliers assume no responsibility for any loss or delay resulting from such use.

2.0 OBJECTIVES, GOALS, PURPOSES AND POLICY OF THIS HASP

Let's be clear about our objectives in this HASP. The purpose of this HASP is to:

- Document a proactive, scientific exposure assessment, which identifies and helps us understand our risks.
- Document proactive precautions we are going to take to avoid the risks.

Let's be clear about our goal in this HASP. Our policy is to:

- Complete our work on this site without incidents of all types; no injuries, no illnesses, no impacts to the environment or to property and equipment. In order to achieve this goal, the project team must work together to perform an effective hazard assessment. The team will then establish appropriate precautions and communicate these daily among project staff. Staff will be responsible for communicating changing field conditions to the project management so these conditions and appropriate precautions may be reevaluated as needed. We expect all subcontractors and project personnel to share this goal.

3.0 SCOPE OF WORK

The scope of this project is to:

- **Install an Air Sparge/Soil Vapor Extraction System; and**
- **Source Removal with an engineered barrier.**

This HASP was prepared for the use of SECOR personnel while performing the following tasks:

1. Driving on Site
2. Well Installation
3. Soil Vapor Extraction System Installation
4. Soil Vapor Sampling
5. Chemical Placement
6. Groundwater Sampling
7. Well Abandonment
8. Soil Excavation

The above stated tasks will be conducted in a manner consistent with the methods and assumptions outlined in the Work Plan entitled: 100% Final Design for the Remedial Design for Source Control for Area 9/10 of the Southeast Rockford Groundwater Contamination Superfund Site. All work plans referenced in this HASP will be available for SECOR personnel onsite.

A general site map is included in **Attachment 2**.

4.0 EMERGENCY RESPONSE

- *Remember this must be specific to the site and discussed with the client/facility manager.*
- *This must be coordinated with other contractors working on the site. This can be done at the initial site meeting, but do not forget to do it.*
- *In addition to injuries and illnesses noted here, this section should also address how the client wants us to respond to: the public or the press, fires, bomb threats, etc.*
- *You must discuss emergency response at the pre-startup meeting with the contractor to make sure that you can act on the response plan in the event of an emergency.*
- *All SECOR staff on site must have completed CPR and First Aid training.*
- *In the event of an injury or illness, notification of the family of the individual involved shall be made as promptly as possible following the office's emergency action plan.*
- *You must have an eyewash bottle with you on site in case you get something in your eyes.*
- **If there is any type of emergency (injury, spill, etc.), work is to be shut down until the situation that caused the emergency is corrected and work can resume without further risk of a similar incident.**
- **All incidents regardless of severity and all near misses shall be reported immediately, (after stabilizing the victim(s)/site), to the SECOR Project Manager who will then contact Philip Platcow, Director of IH/H & S, Mary Harris, Human Resources and Michael Philipp, II/NMI Program Manager. The Project Manager together with Philip Platcow (or Michael Philipp if Mr. Platcow is not available) shall then communicate with the client Project Manager in accordance with the client's incident reporting guidelines.**

The **Site Health & Safety Officer (SHSO)** must be familiar with the directions to the hospital given in **Section 1.** *(It has become common to take directions off the Internet. In some cases these directions are no longer correct. It is the* **SHSO's** *responsibility to ensure that the directions stated in the HASP are absolutely accurate. It may be advisable to ask the client or call a local institution for directions.)*

Injury or Illness

If an injury or illness occurs, take the following action:

- Determine if emergency response (fire/ambulance) staff are necessary. If so, dial **911, 6666 (Facility Emergency Number)** or **(815) 987-5800** (**Rockford Fire Department**) on cell phone or closest available phone. *(**carried by the SECOR SHSO**)* Provide the location of the injured person and other details as requested. If it makes sense to take an individual to the hospital, follow the directions in **Section 1.**

- Get First Aid for the person immediately. Utilize first aid kit in vehicle. Also utilize the bloodborne pathogens kit. *(Make sure you have both kits, or one combined kit).*

- Notify the **SHSO** immediately. The **SHSO** is responsible for contacting the SECOR Project Manager immediately after stabilizing the victim(s)/site. The SECOR Project Manager shall then immediately contact Mary Harris in SECOR's Human Resources, Philip Platcow,

Director of IH/H&S and Michael Philipp. The SECOR Project Manager along with the SHSO, and the Office Health & Safety Coordinator/Operational Excellence Coordinator (and other witnesses, experts, etc.) are responsible for preparing and submitting the Incident/Near Miss Investigation Report to Mary Harris in SECOR's Human Resources, Philip Platcow and Michael Philipp of the SECOR Health & Safety Department within 72 hours of the incident, as well as notifying the employee's supervisor and the Client Manager in accordance with the client's reporting procedure timeline. Use the Incident Investigation / Near Miss Investigation Report in **Attachment 3**.

- The **SHSO** will assume responsibility during a medical emergency until more qualified emergency response personnel arrive at the site.

First Aid Procedures for Minor Cuts, Scratches, Bruises, etc.

- Each occupational illness or injury shall be reported immediately by employees to the **SHSO**. The **SHSO** will complete the Incident Investigation / Near Miss Investigation Report in **Attachment 3** and report the incident to Human Resources.

Medical Cases Not Requiring Ambulance Service

- Medical cases normally not requiring ambulance services are injuries such as minor lacerations, minor sprains, etc.
- The **SHSO** will ensure prompt transportation of the injured person to a physician or hospital following the directions in **Section 1**.
- A representative of SECOR/sub-contractor should always drive the injured employee to the medical facility and remain at the facility until the employee is ready to return.
- If the driver of the vehicle is not familiar with directions to the hospital, a second person shall accompany the driver and the injured employee to the hospital
- If it is necessary for the **SHSO** to accompany the injured employee, provisions must be made to have another employee, properly trained and certified in first aid, to act as the temporary **SHSO**.
- If the injured employee is able to return to the jobsite the same day, he/she should bring with him/her a statement from the doctor containing such information as:

  - Date
  - Employee's name
  - Diagnosis
  - Date he/she is able to return to work, regular or light duty
  - Date he/she is to return to doctor for follow-up appointment, if necessary
  - Signature and address of doctor

If the injured employee is unable to return to the jobsite the same day, the employee who transported him should bring this information back to the jobsite and report it to Mary Harris in Human Resources at (619) 718-9429 and the Director of Industrial Hygiene and Health & Safety, Philip Platcow at (617) 232-7355.

Emergency Cases Requiring Ambulance Services

- Medical cases requiring ambulance services would be such cases as severe head injuries, amputations, heart attacks, etc.
- Should ambulance service be necessary, the following procedures should be taken immediately.
  - Contact necessary ambulance service and company emergency services by dialing **911 or (815) 877-4177** (**Lifeline Ambulance Service**)and notify the **SHSO** for the site.
  - Administer first aid until ambulance service arrives.
  - While the injured employee is being transported, the **SHSO** should contact the medical facility to be utilized.
  - One designated representative should accompany the injured employee to the medical facility and remain at the facility until final diagnosis and other relevant information is obtained.

Death of an Individual or Hospitalization of Three or More Employees

The procedure as outlined in "First Aid and Medical Cases", above, should be followed. If the injured person dies, then SECOR Human Resources Department, local officials and coroner must be notified ***immediately***. SECOR Human Resources will notify the **local OSHA office within 8 hours of the incident or fatality** in the event of fatality or hospitalization of three or more employees.

Response to Spills or Cut Lines

Prevent problems by documenting the location of underground lines (e.g., product, sewer, telephone, fiber optic) before starting site work. If a line or tank is drilled through, or another leak occurs, document the event as soon as possible using the Incident Investigation Report in **Attachment 3. Notification of the event must be made to the SECOR Project Manager by the SHSO immediately after stabilizing the victim(s)/site.** The SECOR Project Manager shall then immediately contact **SECOR Human Resources and the Health & Safety Department.** Include dates, times, actions taken, agreements reached, and names of people involved. Use additional pieces of paper to document the event completely. The **SHSO**, PM and client must be notified immediately. The PM will notify the regulatory authority or utility as necessary.

In the event of a spill/release, follow this plan:

1. Stay upwind of the spill/release.
2. Wear appropriate PPE.
3. Turn off equipment and other sources of ignition.
4. Turn off pumps and shut valves to stop the flow/leak.
5. Plug the leak or collect drippings, when possible.
6. Use sorbent pads to collect product and impede its flow, if possible.
7. Call Fire Department immediately if fire or emergency develops.
8. Inform SECOR Project Manager about the situation.
9. Determine if the client wants SECOR to repair the damage or if the client will use an emergency repair contractor.
10. Based on agreements, contact emergency spill contractor for containment of free product. The contact for this project will be Clean Harbors, Phone:(815) 239-2377
11. Advise the client of spill discharge notification requirements and determine who will complete and submit forms. *(Do not submit or report to agencies without the client's consent.)* Document each interaction with the client and regulators and note, in writing; name, title, authorizations, refusals, decisions, and commitments to any action.
12. Do not transport or approve transportation of contaminated soils or product until proper manifests have been completed and approved. Be aware that soils / product may meet criteria for hazardous waste.
13. Do not sign manifests as generator of wastes; contact PM or Waste Compliance Manager to discuss waste transportation.

Notifications – a spill/release requires completion of an Incident Investigation (II). **The incident shall be reported immediately after stabilizing the victim(s)/site. The PM must involve the client/generator in the Incident Investigation process. The client/generator is under obligation to report to the proper government agencies. If the spill extends into waterways, the Coast Guard and the National Response Center (800) 424-8802 must be notified immediately by the client or by SECOR PM with the client's permission.**

All spills/releases must be reported per site/client requirements per procedures listed in **Attachment 1**.
All spills/releases must be reported to Larry Carlson Phone: (815) 226-6593 at Hamilton Sundstrand.

Emergency Decontamination Procedures

Ensure eyewash bottle, water (unless the chemicals of concern are water reactive), and other decontamination aids are available on-site.

In the event of emergency decontamination:

- Secure area or move/evacuate to the emergency gathering location.
- Immediately remove any contaminated PPE or clothing (gloves, etc.)
- If possible, wash contaminated area with mild soap and water. Use eyewash station if necessary.
- Observe the contaminated area.
- Repeat washing as necessary.
- Notify SHSO immediately.

Exposure to contaminated individuals should be limited to personnel wearing the proper PPE to avoid unnecessary exposure.

5.0 CONTRACTOR EMERGENCY ACTION PLAN

The **SHSO** will ensure that the Subcontractor/Contractor is capable of efficient evacuation/emergency response in the event of an emergency. Subcontractor/Contractor's employees will be trained by their employer in site-specific evacuation/emergency procedures, including alarm systems and evacuation plans and routes.

The Subcontractor/Contractor shall instruct its employees that in the event of an emergency such as a fire, release, or accident involving injuries, they are required to dial **911** or **(815) 987-5800** (**Rockford Police Department**). The reporting employee is to state the problem clearly and fully and remain on the line until dismissed by the operator.

SECOR staff and Subcontractor/Contractors working in an area where an emergency exists shall evacuate to a safe location, preferably upwind, away from the area and take attendance. **The gathering location will be determined by the SECOR SHSO upon arrival on site. As a default, the gathering point for personnel north of Plant 1 is the parking lot near the intersection of 9th Street and 23rd Avenue. The gathering point for personnel south of Plant 1 is the parking lot in the southeast portion of Plant 1 along 11th Street. If the gathering points are obstructed or unsafe, a new gathering point will be identified in conjunction with Hamilton Sundstrand personnel. It is the responsibility of the SHSO to annotate the Site Plan with the gathering location position (as shown on Figure 1.4) and to disseminate that info to all site personnel during the Daily Production Safety Meeting and any other appropriate time after that.**

(If the emergency causes the route to a gate surrounding the site to be closed, the SECOR staff and Subcontractor/Contractors shall move to an open area upwind of the hazard area, and remain there until instructed by emergency response personnel [i.e., police, fire, ambulance, paramedics, etc.] to do otherwise.)

Subcontractor/Contractor has the responsibility to account for its own employees and to provide such information immediately to emergency response personnel upon request.

SECOR staff and Subcontractor/Contractor may not reenter the emergency site without specific approval from emergency response personnel.

In the event of fire ignition in close proximity to SECOR staff and Subcontractor/Contractor's employees, those persons shall evacuate the area and notify emergency personnel unless the fire is readily extinguished with portable dry chemical equipment on-hand. **When in doubt, emergency response personnel shall be notified.**

6.0 BACKGROUND INFORMATION ON THE PROJECT SITE

Area 9/10 is an industrial area located within the City of Rockford, Winnebago County, Illinois. The Area is bound by Eleventh Street on the east, Twenty-Third Avenue on the north, Harrison Avenue on the south, and Sixth Street on the west. Hamilton Sundstrand (HS) Plant 1 facility (the Site) is located within Area 9/10. The address of the Site is 2421 Eleventh Street. The HS Plant 1 facility is a rectangular area of approximately 13 acres. The Site is bound on the north by 23rd Avenue and former Mid-States Industrial (2401 Eleventh Street), on the south by the former Nylint/DRB property (2525 Eleventh Street) and the Rockford Products Parking lot, on the west by 9th Street, and on the east by 11th Street.

SECOR conducted a Pre-Design Investigation (PDI) from 2003 to 2005. The PDI was initiated to complete the site characterization at the HS Plant 1 facility within Area 9/10 and provide data to identify locations or potential locations of source material such that remedial design activities could be completed effectively. The PDI results identified three areas where potential source material was found. One of these areas was associated with groundwater and two of these areas are related to soil impact.

Results of the PDI identified groundwater impacted with volatile organic compounds (VOCs) above the Preliminary Remediation Goals (PRGs). The PRGs were based on 35 IAC Part 620 Groundwater Quality Class I groundwater, 35 IAC Part 742 Tiered Approach to Corrective Action Objectives (TACO), and USEPA maximum contaminant level (MCL) regulations.

The constituents of concern (COCs) in groundwater were identified as 1,1-dichloroethene (1,1-DCE); 1,1-dichloroethane (1,1-DCA); 1,2-dichloroethane (1,2-DCA); benzene; chloroform; tetrachloroethene (PCE); 1,1,1-trichloroethane (1,1,1 TCA); 1,1,2-trichloroethane (1,1,2-TCA); trichloroethene (TCE); and vinyl chloride (VC). The COCs in soil were identified as cadmium; lead; 1,1-DCE; methylene chloride (MC) (possible laboratory artifact); PCE; 1,1,1-TCA; and TCE.

7.0 CLIENT SAFETY PROCEDURES

See Attachment #1 (CLIENT SAFETY PROCEDURES)

See **Attachment 1**

8.0 GOVERNMENT AND LINE LOCATOR CONTACT NAMES AND PHONE NUMBERS

AGENCY or LINE LOCATOR	NAME	TELEPHONE NO	VERIFIED
National Response Center	(24 Hour Hotline)	(800) 424-8802	YES
U.S. E.P.A.	(24 Hour Hotline)	(800) 424-9346	YES
U.S. National Poison Control Center	(24 Hour Hotline)	(800) 222-1222	YES
IEPA	Tom Williams	(815) 223-1714	YES
Illinois Emergency Management Agency	Regional Office	(815)357-8963	YES
Rockford Public Works	Brad Moberg	(815) 987-5570	YES
LINE LOCATOR	JULIE / DIGGERS Hotline	(800) 892-0123	YES
NICOR	(24 Hour Hotline)	(888) 642-6748	YES
ComEd	(24 Hour Hotline)	(800) 334-7661	YES
Insight Communication (cable tv)	(24 Hour Hotline)	(815) 987-4570	YES
AT&T	(24 Hour Hotline)	(800) 660-3000	YES
Rockford Water Division	(24 Hour Hotline)	(815) 987-5700	YES
Rock River Water Reclamation District	(24 Hour Hotline)	(815) 387-7600	YES

9.0 PROJECT PERSONNEL AND RELEVANT INFORMATION

Questions about this project posed by neighbors, the press, or other interested parties should be directed to:

Name: Larry Carlson Company: Hamilton Sundstrand Phone: (815) 226-6593

The site phone number is a Cell Phone - Personal carried by the SECOR SHSO = (414) 526-8136

Site personnel shall be trained and certified in hazardous waste operations; specifically,

- 40-Hour HAZWOPER Training and a current;
- Annual 8-Hour Refresher [29 CFR 1910.120(e)(8)];
- First Aid/CPR training; and
- Shall have had a physical examination consistent with 29 Code of Federal Regulations (CFR) 1910.120. (and 8 California Code of Regulations (CCR) 5192, if applicable.)

In addition, the Site Manager/SHSO will have Supervisory 8-hour Training [29 CFR 1910.120(e)(4)].

Subcontractors shall review and sign the form in **Attachment 12 ACKNOWLEDGMENT & AGREEMENT FORM**

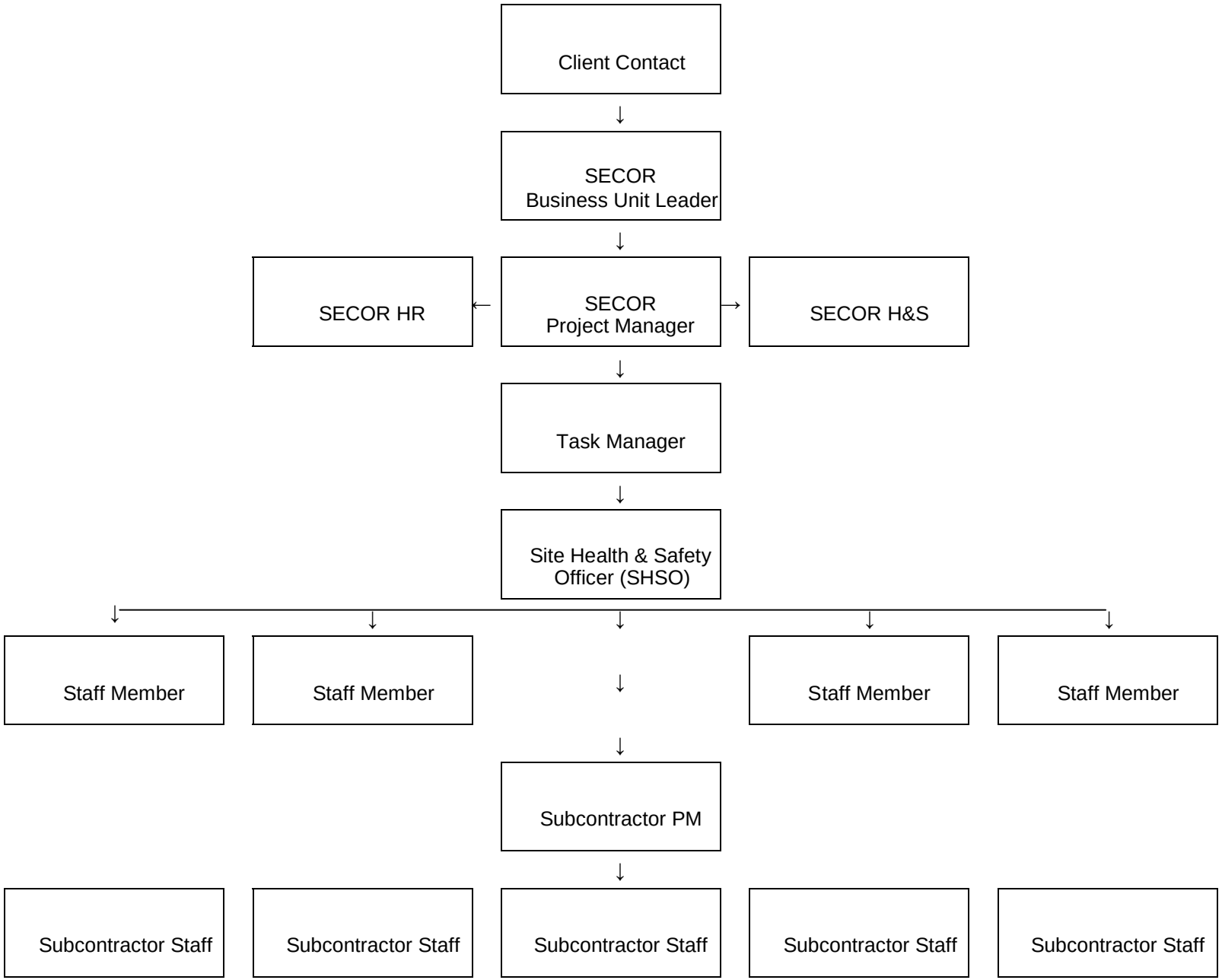
The table below summarizes project personnel, responsibilities, and training dates.

PROJECT JOB TITLE	NAME	TELEPHONE NO.	GENERAL PROJECT RESPONSIBILITIES	40-Hr HAZWOPER	8-Hr Refresher	CPR/First -Aid	MEDICAL SURVEILANCE DATE
Site Health and Safety Officer	**Chris Armes**	**(414)526-8136 Cell (414)289-0209 Home**	Implementing this HASP. Has authority to stop work. Perform air quality tasks. Take charge of all incidents. Review subcontractor HASP	**8/23/1996**	**8/15/2006**	**5/4/2005**	**6/7/2006**
Task Manager	**John Puckett**	**(847) 836-8106 Home (847) 502-8300**	Contact client and subs to understand all hazards. Discuss with SHSO. Follow-up all incidents upon notice.	**11/06/2003**	**8/15/2006**	**3/1/2005**	**2/23/2006**
SECOR Office Operations and Project Manager	**Keith Wilcoxson**	**(630) 605-3196 Cell (630)551-0121 Home**	Overall financial and logistics. Provide immediate support at notice of all incidents	**6/15/1990**	**8/15/2006**	**5/4/2005**	**2/22/2007**
Project Engineer	**John Puckett**	**(847) 836-8106 Home (847) 502-8300**	Overall adherence of site work with specification and plans including conducting work in accordance with JSA and this HASP. Report all incidents and near misses immediately to Project Manager.	**11/06/2003**	**8/15/2006**	**3/1/2005**	**2/23/2006**

Office Health and Safety Coordinator	**David Vasquez**	**(847) 632-1634 Home (630)561-5015 cell**	Manage Health and Safety responsibilities for personnel in Office. Assist employees with setting up training and attending/completing necessary courses.	**7/15/1990**	**8/15/2006**	**5/4/2005**	**3/22/2006**
Project Staff	**Bob Mesec**	**(630)561-4419 Cell (708) 784-9541 Home**	Conduct work in accordance with JSA and this HASP. Report all incidents and near misses immediately to Project Manager.	**1/15/1990**	**8/15/2006**	**6/22/2005**	**10/3/2006**
Project Staff	**David Vasquez**	**(847) 632-1634 Home (630)561-5015 cell**	Conduct work in accordance with JSA and this HASP. Report all incidents and near misses immediately to Project Manager.	**7/15/1990**	**8/15/2006**	**5/4/2005**	**3/22/2006**
Project Staff	**Amy Rodebaugh**	**(630) 267-9861 Cell (630) 303-2728 Home**	Conduct work in accordance with JSA and this HASP. Report all incidents and near misses immediately to Project Manager.	**9/19/2003**	**8/15/2006**	**3/1/2005**	**1/26/2006**
Project Staff	**Craig Varland**	**(414)803-7726 Cell** (414)762-9754 Home	Conduct work in accordance with JSA and this HASP. Report all incidents and near misses immediately to Project Manager.	**4/6/2001**	**8/15/2006**	**5/4/2005**	**3/16/2006**
SECOR Director of Industrial Hygiene	**Philip Platcow**	**(617) 232-7355 Cell (617) 739-1224 Home**	Respond with corporate resources to all incidents as appropriate. Assist in HASP review. Assist in incident investigation.	**1/13/1995**	**2/2/2006**	**1/20/2005**	**3/7/2006**
SECOR Human Resources Director	**Marguerite Shuffelton**	**(619) 718-9430 Cell (760) 749-9603 Home**	Assist with incident review, recordkeeping.	**N/A**	**N/A**	**N/A**	**N/A**
Client Plant Contact	**Larry Carlson**	**(815) 226-6593**	Provide all known analytical data performed by others and notice of hazards. Provide access to site and available emergency response capabilities.	**N/A**	**N/A**	**N/A**	**N/A**
Client Project Manager	**Scott Moyer**	**(815) 226-6232**	Provide all known analytical data performed by others and notice of hazards. Provide access to site and available emergency response capabilities.	**N/A**	**N/A**	**N/A**	**N/A**

- Other training may be required such as LPS, Passport, Fall Protection, Lock Out Tag Out, Hot Work, Confined Space, etc. according to the clients training requirements and hazards specific to the job being performed. Enter into the table below.

NAME	TRAINING COURSE	DATE	RECERTIFICATION DUE


Client Contact
SECOR
Business Unit Leader
SECOR HR
SECOR
Project Manager
SECOR H&S
Task Manager
Site Health & Safety
Officer (SHSO)
Staff Member
Staff Member
Staff Member
Staff Member
Subcontractor PM
Subcontractor Staff
Subcontractor Staff
Subcontractor Staff
Subcontractor Staff
Subcontractor Staff

10.0 CONSTITUENTS OF POTENTIAL CONCERN AND MAXIMUM CONCENTRATIONS IDENTIFIED ONSITE

Listed below are the maximum concentrations of contaminants in the soil and/or groundwater that have been encountered at the site to date.

Substance	Date of Sample	Media	Sample Concentration
Benzene	4/27/2004	Groundwater	310 ug/L
Cadmium	10/29/2003	Soil	310 ug/kg
Chloroform	11/17/20004	Groundwater	0.7 ug/L
1,1-DCA (Dichloroethane)	11/16/2004	Groundwater	30,000 ug/L
1,2-DCA (Dichloroethane)	11/16/2004	Groundwater	7.7 ug/L
1,1-DCE (Dichloroethene)	11/18/2004	Groundwater	1,700 ug/L
1,1-DCE (Dichloroethene)	10/28/2003	Soil	1,300 ug/kg
Lead	10/29/2009	Soil	43 ug/kg
MC (Methylene Chloride)	10/27/2003	Soil	140 ug/kg
PCE (Tetrachloroethene)	10/24/2003	Soil	550,000 ug/kg
PCE (Tetrachloroethene)	11/16/2004	Groundwater	290 ug/L
1,1,1-TCA (Trichloroethane)	10/28/2003	Soil	240,000 ug/kg
1,1,1-TCA (Trichloroethane)	11/16/2004	Groundwater	34,000 ug/L
1,1,2-TCA (Trichloroethane)	11/16/2004	Groundwater	14 ug/L
TCE (Trichloroethene)	11/16/2004	Groundwater	200 ug/L
TCE (Trichloroethene)	10/28/2003	Soil	20,000 ug/kg
VC (Vinyl Chloride)	11/16/2004	Groundwater	3,500 ug/L

11.0 POTENTIAL AIRBORNE CONCERNS

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT SHSO WITH QUESTIONS						
CHEMICAL (OR CLASS)	**OSHA PEL ACGIH TLV**	**OTHER PERTINENT LIMITS**	**WARNING PROPERTIES**	**ROUTES OF EXPOSURE OR IRRITATION**	**ACUTE HEALTH EFFECTS**	**CHRONIC HEALTH EFFECTS/ TARGET ORGANS**
Benzene	PEL 5 ppm	REL 0.1 ppm	Colorless to light-yellow liquid with an aromatic odor.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation eyes, skin, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude (weakness, exhaustion).	Dermatitis; bone marrow depressant/depression; (Potential occupational carcinogen)
Cadmium	PEL 0.005 ppm	REL 0.1 ppm	Silver-white, blue-tinged lustrous, odorless solid.	Inhalation, ingestion	pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell),	emphysema, proteinuria, mild anemia; [Potential occupational carcinogen]

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT SHSO WITH QUESTIONS						
Chloroform	PEL 50 ppm	REL 2 ppm	Colorless liquid with a pleasant odor.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, fatigue; anesthesia.	Enlarged liver; (Potential occupational carcinogen)
1,1-DCA (Dichloroethane)		REL 001 ppm	Volatile oil with a disagreeable sweetish odor	Inhalation, skin absorption. ingestion, skin and/or eye contact.	Headache, loss of appetite, nausea, vomiting	Intense jaw pain, cranial nerve palsy; in animals: kidney, liver, brain injury; weight loss; (Potential occupational carcinogen) CNS effects
1,2-DCA (Dichloroethane))	PEL 50 ppm PEL 1 ppm TLV 1011100 ppm		Clear, colorless, oily liquid. Can darken with age. Can have a pleasant odor.	Inhalation, absorption skin or eyes, ingestion.	Irritation to eyes, skin, respiratory tract, mucous membranes. Headache, nausea, vomiting, Irritability, CNS depression.	Eyes, liver, kidney, skin, CNS.

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT SHSO WITH QUESTIONS						
1,1-DCE (Dichloroethene)	PEL 10 ppm FedOSHA PEL None Established TLV 50 ppm		Colorless liquid or gas (above 89F) with a mild, sweet, chloroform-like odor	Inhalation, skin absorption, ingestion, and/or eye contact	Irritation to eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty)	Liver, kidney dysfunction; pneumonitis; Potential occupational liver and kidney carcinogen. Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys
Lead	TWA 0.100 ppm OSHA PEL (8-hour TWA) 0.050 ppm	REL 0.10 ppm	A heavy, ductile, soft, gray solid.	Inhalation, ingestion, skin and/or eye contact	weakness, lassitude (weakness, exhaustion), insomnia; facial pallor, constipation, abdominal pain, colic; anemia	Encephalo-pathy; kidney disease; irritation eyes; hypotension
MC (Methylene Chloride)	PEL 25 ppm TLV 50 ppm	STEL 125 ppm	Colorless liquid with a chloroform-like odor.	Inhalation, dermal, ingestion, eyes	Irritation to eyes, skin; fatigue, weakness, somnolence (sleepiness, unnatural drowsiness), lightheaded-ness; numbness, tingle limbs; nausea.	Potential occupational carcinogen. Target Organs Eyes, skin, cardiovascular system, central nervous system.

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT SHSO WITH QUESTIONS						
PCE (Tetrachloroethene)	PEL 25 ppm PEL 100 ppm TLV 25 ppm	Ceiling 200 ppm STEL 100 ppm STEL 100 ppm	Colorless liquid with a mild, chloroform-like odor	Inhalation, skin absorption, ingestion, and/or eye contact	Irritation to eyes, skin, nose, throat, respiratory system; nausea; flushed face, neck; vertigo (an illusion of movement), dizziness, in coordination; headache, skin erythema (skin redness)	Somnolence (sleepiness, unnatural drowsiness); liver damage; Potential occupational liver carcinogen. Target Organs: Eyes, skin, respiratory system, liver, kidneys, central nervous system
1,1,1-TCA (Trichloroethane)	PEL 350 ppm TLV 350 ppm PEL 800 ppm	Ceiling 350 ppm STEL 450 ppm STEL 450 ppm	Colorless liquid with a mild, chloroform-like odor	Inhalation, skin absorption, ingestion, and/or eye contact	Irritation to eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depressant/de-pression, poor equilibrium; dermatitis	Cardiac arrhythmias; liver damage. Target Organs: Eyes, skin, central nervous system, cardiovascular system, liver

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT SHSO WITH QUESTIONS						
1,1,2-TCA (Trichloroethane)	PEL 10453 ppm TLV 10 ppm	REL 10453 ppm	Colorless liquid with a sweet, chloroform-like odor	Inhalation, skin absorption, ingestion, and/or eye contact	Irritation to eyes, nose; central nervous system depressant/de-pression; dermatitis	Liver, kidney damage; Potential occupational liver carcinogen. Target Organs: Eyes, respiratory system, central nervous system, liver, kidneys
TCE (Trichloroethene)	PEL 25 ppm PEL 100 ppm TLV 50 ppm	Ceiling 200 ppm STEL 100 ppm	Colorless liquid (unless dyed blue) with a chloroform-like odor.	Inhalation, dermal, ingestion, eyes	Irritation to eyes, skin; headache, vertigo (an illusion of movement); visual disturbance, fatigue, giddiness, tremor, somnolence (sleepiness, unnatural drowsiness), nausea, vomiting; dermatitis;	Cardiac arrhythmias, paresthesia; liver injury; Potential occupational carcinogen of liver and kidney

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT SHSO WITH QUESTIONS						
VC (Vinyl Chloride)	PEL 10 ppm TLV 10 ppm		Liquid with a pleasant odor at high concentrations	Inhalation, dermal and eye contact.	Weakness; abdominal pain, pallor or cyanosis of extremities; liquid: frostbite;	Gastrointest-`inal bleeding; enlarged liver; potential occupational liver carcinogen; damage also to central nervous system, blood, respiratory system, lymphatic system.

Explanation of Abbreviations

Abbreviation	Explanation
PEL	Permissible Exposure Limit
REL	Recommended exposure limit set by NIOSH
C	Ceiling limit
STEL	Short Term Exposure Limit
IDLH	Immediately Dangerous to Life or Health
TLV	Threshold Limit Value set by the ACGIH (American Conference of Governmental Industrial Hygienists)
AIHA WEEL	Workplace Environmental Exposure Limits set by the AIHA (American Industrial Hygiene Association)
SKIN	Skin absorption
NIOSH	National Institute for Occupation Safety and Health
CNS	Central Nervous System
CVS	cardiovascular system

Action Level Table for Air Quality Monitoring

- *The level for respirator use indicated below is that concentration at which a respirator must be put on. It does not necessarily require the job to stop. The respirator is a tool to be used while determining why the exposure has reached that concentration. Take action to reduce the concentration by engineering controls such as water mist, spray foam, plastic cover, etc.*
- *The level for work stoppage indicated below is that concentration at which work on the job must stop. Determine why exposures have reached that concentration and how they can be reduced. Site evacuation is not necessary at this level. It does not mean that stopping operations should reduce the likelihood that the concentration will continue to rise. Implement engineering controls to reduce the concentration, and then resume work.*
- ***PIDs – Photoionization Detectors** are used for general hydrocarbon monitoring; an example would be benzene, toluene, ethyl benzene and xylene, common on gasoline station sites. The PID typically uses either a 10.6 eV lamp (responds to pentane and higher hydrocarbons), or 11.7 eV lamp (responds to ethane (weakly), propane and higher hydrocarbons) to ionize and detect the gas. The PID will measure hydrocarbons that are ionized, and therefore is a screening device, not a chemical-specific measurement instrument. For chlorinated compounds, an 11.4 eV or higher lamp will be utilized.*
- ***FIDs – Flame Ionization Detectors** – Uses a hydrogen flame to ionize the gas and detect its concentration. Typically used to measure concentrations of natural gas or gases that can not be ionized by the PID. Use of an FID may not be intrinsically safe for use on high hazard sites where there is a danger of reaching the lower explosive limit of the gas being measured. FID's are typically calibrated using methane. **Always follow the manufacturer's instructions for calibrating the FID and for calculating response and correction factors.***
- ***Combustible Gas Meters** – **Measure 10% of the LEL** or Lower Explosive Limit for the particular gas of concern – check the MSDS for the LEL. Combustible gas meters are usually equipped with an oxygen monitor measuring in % Oxygen. These meters are used in potentially explosive environments or where the PID measurement is at or above 100ppm. Example: Gasoline has an LEL of 1.7%. 1% = 10,000 PPM. LEL of 1.7% = 17,000 PPM and 10% of that is 1700 PPM.*
- ***Draeger Tubes** – colorimetric tubes where air sample is pulled through the tube using a pump. The results are read from the color change on the tube. Follow the manufacturer's directions.*
- *Use of PDA's, cell phones, pagers or other electrical devices (with the exception of intrinsically safe monitoring instruments) are prohibited in the exclusion zone until the atmosphere is considered safe through the use of a CGI.*
- *The "levels for work stoppage" listed in the table below are based on measurements taken using PIDs calibrated with isobutylene; PIDs calibrated with gases other than isobutylene may have a different response factor. When calibrating with a calibration gas other than isobutylene, contact Phil Platcow, Director of IH/H & S, at (617) 232-7355 office/(617)899-5403 cell or Pat Wilson, CIH, at (817) 640-9621X34 office/(817) 296-3165 cell, for guidance on the air monitoring requirements*
- ***These values can be modified with particular knowledge of contaminants and site conditions. Contact Director of Industrial Hygiene & Health and Safety, Philip Platcow to discuss (617) 232-7355.***
- ***During the coarse of the activities at the Site, SECOR plans to monitor particle concentrations around the perimeter of the exclusion zone and take necessary action such as halting work, adjusting work areas, adjusting work activities hours and among other actions.***

CHEMICAL (OR CLASS)	MONITORING EQUIPMENT	TASK	MONITORING FREQUENCY/ LOCATION	LEVEL FOR RESPIRATOR USE	LEVEL FOR WORK STOPPAGE
Volatile Organic Vapors	FID/PID as appropriate for chemicals of concern. Read manual to confirm appropriateness. An 11.7 eV lamp (or equivalent) will be utilized. Draeger Tube for vinyl chloride (model 1/a part number 67 28031). Draeger Tube for benzene (model 0.5/a).	From start of mobilization to completion and demobilization	Sampling should be continuous during the project while disturbing potentially contaminated soil or uncovering/removing tanks and piping, or during drilling. At least every 15 minutes in the breathing zone. Sample at the exclusion zone boundaries every 30 minutes. Continuously sample during each soil and groundwater sampling interval. If 5 ppm in breathing zone, collect a Draeger tube for benzene and/or vinyl chloride (depending upon contaminants of concern).	Respirator to be used will be full-face piece respirator with organic vapor/P 100 combination cartridges. 20 ppm sustained in breathing zone for 2 minutes, and no benzene and/or vinyl chloride tube discoloration. If a color change appears on tube for benzene or vinyl chloride at < 20ppm on PID/FID, don respirator. If no Draeger Tubes are available, the level for respirator use will be 5ppm on the PID/FID. At donning respirator level, determine cause of exposure and implement engineering controls to reduce concentrations.	50 ppm in breathing zone and no vinyl chloride or benzene tube discoloration. Stop work if tube indicates > 1ppm for benzene or vinyl chloride. If no Draeger Tube available, stop work at 25 ppm on the PID/FID. Continuously attempt to determine cause of exposure and usage of engineering controls to attempt to never reach the stop work level.

12.0 WASTE CHARACTERISTICS

A. Waste Generation (Type(s)/Quantities Expected):

Anticipated (YES/NO): YES

Types: Liquid __X__ Solid __X__ Sludge ____ Other (describe) _____

Quantity (Expected Volume): 600 cubic yards

B. Characteristics (Expected):

Corrosive ___ Flammable/Ignitable ___ Radioactive ___ Toxic __x__

Reactive _____ Unknown _____

Other (specify)_____x_____ Listed Hazardous Waste – some soil exceed Land Disposal Restriction levels and will require treatment prior to disposal.

C. Packaging requirements for waste material (Expected):

- DOT-approved drums __X__
- Baker tanks—water (possibly tankers if trucked off site) __X__
- Lined waste bins__X__
- 5 gallon buckets__X__
- _____

D. Disposal and/or Treatment Methods Proposed:

All wastes will be sampled and characterized. Results of analysis will determine how and where impacted materials may be disposed of. SECOR will be responsible for the characterization and coordination of transportation of all waste generated on this site. All materials will be disposed of or treated in accordance with federal, state and local regulations as selected and arranged by SECOR/Hamilton Sundstrand. The client Hamilton Sundstrand will be responsible for signing the manifest.

13.0 DETAILED PROJECT STEPS WITH HAZARD ASSESSMENTS, PRECAUTIONS AND JSAs

1. Driving on Site
2. Well Installation
3. Soil Vapor Extraction System Installation
4. Soil Vapor Sampling
5. Chemical Placement
6. Groundwater Sampling
7. Well Abandonment
8. Soil Excavation

Traffic Guidance and Control Plan:

Incidents on sites have shown the need for a well-thought out traffic guidance and control plan. This plan must consider:

- *Level of traffic activity on a site and provide for the safety of all workers on the site. E.g., a gasoline site that is open to the public should require sawhorse barricades to protect workers.*
- *Using flagger's in high hazard areas.*
- *Stepping back and evaluating (PPE/SPSA) the Traffic Guidance and Control setup to see if it will really protect you.*
- *Stop Work Authority if after performing a PPE/SPSA and the set up isn't protecting you as planned.*
- *Cones and caution tape have proven ineffective in a number of situations. Other traffic guidance and control precautions include, delineators, placing vehicles between staff and the public, construction fence, etc.*
- *We must cordon off as much space as is necessary to ensure our safety. This must be discussed with clients as it may mean closing down additional gasoline pumps or entrances to a factory, etc.*
- *Personal vehicles should be parked as far away from potential traffic as possible.*
- *How contractor heavy equipment, e.g., vacuum trucks, drill rigs, cranes, loader/diggers, etc will be parked and maneuvered around the site. All heavy equipment movements must be coordinated in advance to avoid incidents.*
- *Review local regulations for: formally developed traffic guidance and control plans signed by licensed individuals, police details, flagmen, hours of activity, closure of streets to move equipment, etc.*
- *Review the SECOR Safe Driving Procedures located in* **Attachment 6**.
- *Utilize the Journey Hazard Assessment Card to identify potential driving/journey/traffic hazards before each trip. Copies of the Journey Hazard Assessment Card are located in* **Attachment 6a**.
- *Utilize the Daily Vehicle Checklist at least once a day for each vehicle driven for SECOR business to identify potential vehicle issues/hazards. Copies of the Daily Vehicle Inspection Checklist are located in* **Attachment 6b**.
- *Have each team member who will travel to/from the site complete a Journey Management Plan (JPM) before traveling to identify routes of travel and potential driving/journey/traffic hazards. JMP(s) should be kept with each traveling employee throughout the entire course of travel. A blank JMP is included in* **Attachment 6c**.
- *A SECOR Vehicle Collision Kit should be kept in every vehicle used for SECOR project work. A copy of the SECOR Vehicle Collision Kit is located in* **Attachment 6d**.
- **It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a "formally developed" Traffic Guidance and Control Plan is not available. It is also the responsibility of the SHSO to disseminate the Traffic Guidance and Control information to all site personnel during the Daily Production Safety Meeting and any other time as necessary.**

Work on this project will be conducted during the hours: **Start: 7:00 AM End: 6:00 PM Monday -- Friday**

Daily Production Safety Meeting

A safety meeting will be conducted in the morning on each working day on the site to discuss the health and safety issues for the activities to be conducted that day. The topics of the meeting will include, at a minimum, general health and safety procedures, reviewing heath and safety policies and reviewing the job hazard analyses for the tasks to be conducted. Additional safety meetings may be conducted if the scope of work changes during the day, or if other health and safety issues are identified. Suggested meeting topics and daily meeting log sheets are included in **Attachment 11**.

Hazard Communication

All employees at the Site must review this site wide HASP prior to field activities. The information in the JSAs and the attached data sheets is made available to all employees who could be affected by it prior to the time they begin their work activities. Modifications to JSAs and the accompanying data sheets are communicated during routine briefings. Consistent with OSHA regulations, SECOR must also inform other contractors and subcontractors about the nature and level of hazardous substances at this site, and the likely degree of exposure to workers who participate in site operations.

Evacuation Information

Randomly scheduled evacuation drills may be conducted at any time during field activities. Employees should follow emergency procedures outlined in **Section 4** of this HASP and discussed during the day's daily production safety meeting.

Shutoff valves/switches for utilities and products: **It is the responsibility of the SHSO to annotate the Site Plan with the location of all shutoff valves and switches and to disseminate that information to all site personnel during the Daily Production Safety Meeting and any other time as necessary.**

Personal Protective Equipment

The site-specific Personal Protective Equipment (PPE) ensembles and materials are identified in the Job Safety Analysis (JSA) sheets located later in this section. The PPE ensembles listed in each JSA has been identified as appropriate to protect the worker for the task addressed. The PPE ensembles are consistent with Appendix B of 29 CFR 1910.120. PPE is to be used in accordance with manufacturers' recommendations.

Personal Safety Concerns and Precautions: **"There are no other safety concerns associated with this site other than those normally encountered on a hazardous waste site."**

Jewelry safety: **Jewelry can be dangerous. Large ear rings, long necklaces, loose-fitting bracelets, rings, watches, etc. can become entangled in machinery and cause removal of limbs, as well as be conductive of electricity. Use caution and avoid unnecessary hazards!**

Personal Hygiene

No eating, drinking or tobacco use within the exclusion zone. Wash your hands, face, arms, and neck (i.e. any exposed skin) before leaving the site.

Permits

This HASP will serve as the general permit to work for this site. Other permits that may be required such as, authorization to work, confined space entry, and other required "work" permits are to be kept in **Attachment 7**.

Additional Physical and Biological Concerns

Any additional health and safety issues such as **physical concerns** (including but not limited to uneven terrain, electrical fencing, buried spikes, tsunamis, holes, extreme heat/cold etc) or **biological concerns** (including but not limited to poisonous spiders, bees/wasps/other flying/stinging insects, gophers (holes), wild dogs, poisonous/allergenic plants, etc) should be identified prior to work with precautionary measures listed in **Attachment 8**.

Material Safety Data Sheets

Material Safety Data Sheets (MSDSs) for all compounds used and/or found on site should be obtained prior to work on site. Current copies of MSDSs are to be maintained on site in this HASP in **Attachment 9**.

Cameras

Prior to using a camera or other electronic recording devices on this site, all contractors and/or visitors must obtain written approval from the property owner and/or Client's Project Manager.

Task 1. Driving on Site

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
			3/7/2006	Eric Miller	RE Support #3 Purity and BeeJay Scales
			11/21/2005	Philip, Platcow	Director of Industrial Hygiene and Health and Safety
X	Michael Philipp	West Region Health and Safety Manager	11/21/2005		
			2/2/2006	Michael Philipp	West Region Health and Safety Manager
			4/7/2006	Christina DeJarlais	OE Coordinator
		Site specific edits to this JSA were made by	01/05/2007	Chris Armes	Project Geologist
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
PRE-TRIP - Review PPE/SPSA Card.	Window scraper	Consider worst case outcome of vehicle operation (blowout, breakdown, collision, slippery surfaces, injury or death).	● Assess the potential hazards. Analyze how to reduce the risk. Act to ensure safe operation of the vehicle SECOR/Contractor.
Verify Journey Management Plan is complete and current		Unexpected traffic detours	● Assure directions are available and understood prior to commencing travel SECOR/Contractor. ● Pull the vehicle into a safe location if additional directions must be confirmed SECOR/Contractor. ● Increase following distance to allow extra time to stop if you are in unfamiliar territory SECOR/Contractor.

Verify a Vehicle Collision Kit, a 3-lb type ABC fire extinguisher and other as needed emergency equipment is in the vehicle	Fire Extinguisher	Fire in vehicle, vehicle incident	● Verify prepared field kit is in the vehicle. Inventory of the kit should include first aid kit, blood borne pathogen kit, fire extinguisher, collision kit, flashlight, sampling tools, etc. SECOR/Contractor. ● For cold weather areas the inventory should also include a bag of sand, a bag of salt, gloves, wool socks, wool caps, wool blankets, tire chains, small shovel and matches.
Perform perimeter walk around of vehicle for damage or unusual conditions.	Window scraper	Flat tire, blowout, impaired vision, collision, slippery surfaces, injury or death.	● Use SECOR Vehicle Daily Inspection Report SECOR/Contractor. ● Assure tires are properly inflated and there is sufficient tread SECOR/Contractor. ● Assure there are no cuts or bulges in the sidewalls SECOR/Contractor. ● Assure windshield and window glass is clean SECOR/Contractor. ● Lift wiper arms and check wiper blades for damage or deterioration SECOR/Contractor. ● Check behind vehicle for obstructions SECOR/Contractor. ● Check under vehicle engine for evidence of fluid leaks SECOR/Contractor. ● Do not touch metal with moist or wet skin SECOR/Contractor. ● Scrape windows, front and rear windshields SECOR/Contractor.
Check and adjust seat, mirrors, headlamps, turn signals, washer/wipers.	Window scraper	Back or body strain. Blind spots. Inability to signal intentions. Streaking windshield, impaired vision.	● Adjust seat so back is fully supported, upper arms close to body, pedals within easy reach SECOR/Contractor. ● Lower steering wheel so hands are below shoulders and shoulders are relaxed SECOR/Contractor. ● Check mirror adjustments each time vehicle is re-started SECOR/Contractor. ● Test operations of front and rear turn signals SECOR/Contractor SECOR/Contractor. ● Locate and test operation of headlamps, wiper and washer switches SECOR/Contractor. ● Verify heater and windshield defroster fan operates properly SECOR/Contractor.
Check and verify emergency equipment		Unexpected situations.	● Have within the vehicle, and maintain the integrity of, a first aid and blood borne pathogen kit and an eye wash bottle SECOR/Contractor. ● Fire extinguisher SECOR/Contractor.
Site specific emergency equipment		Unexpected situations.	● When applicable, each vehicle is to be outfitted with site specific emergency equipment in the vehicle (i.e. snake bit kit, hypothermia kit) SECOR/Contractor.
Fasten seat belts.		Increased risk of more serious injury or death in collision.	● Assure seat belt is in good condition and fastened SECOR/Contractor ● Assure all passenger seat belts are in good condition and fastened SECOR/Contractor.

Lock doors.		Ejection from vehicle in collision. Unwanted intrusion.	● Lock all doors to vehicle SECOR/Contractor.
Cellular Phone Usage		Driver distractions and static electric discharge that could lead to preventable incidents	● Always turn cellular phones to the off position before starting the engine SECOR/Contractor. ● Do not use cellular phones when refueling SECOR/Contractor.
Start engine and let vehicle warm up.		Unexpected movement.	● Refer to Manufacturers vehicle manual for warm up times SECOR/Contractor. ● Assure that transmission is in 'Park' or neutral if a standard transmission and that parking brake is set SECOR/Contractor.
Check heater, defroster, gauges and warning lights.		Overheated engine or break-down due to lack of critical fluids. Brake failure. Stranding.	● Assure there is sufficient gas, oil and other critical fluids SECOR/Contractor.
Pull out of parking space.		Collision with other vehicles, pedestrians, or stationary objects.	● Check mirrors and over shoulder in all directions prior to pulling out of parking space SECOR/Contractor. ● Signal if parallel parked along a street SECOR/Contractor. ● If reversing with 2 or more personnel in the vehicle, then at least 1 person must exit the vehicle and act as a spotter. If alone before getting in the car, assess the area looking for approaching pedestrians/vehicles. When clear get in vehicle, do a 360 scan then put in gear. While looking over your shoulder, slowly back out of the parking space being prepared to apply the brakes if needed SECOR/Contractor.
DURING TRIP Scan Move your eyes.		Collision, injury or death to occupants or other parties.	● Move eyes at least every 2 seconds SECOR/Contractor. ● Scan major and minor intersections before entry (left-right-left) SECOR/Contractor. ● Check mirrors when slowing or stopping vehicle SECOR/Contractor. ● Scan mirrors frequently, at least one mirror every 5-8 seconds SECOR/Contractor. ● Avoid staring while evaluating road conditions SECOR/Contractor. ● Maintain adequate spacing between your vehicle and the vehicle in front of you. (Rule of thumb one second for every 10 miles per hour, minimum of 3 seconds), double the distance during poor road conditions) SECOR/Contractor. ● Watch for ice on road, slow down before hitting the ice, keep your foot off the brake SECOR/Contractor.

Elevate - elevate your line of sight		Collision, injury or death to occupants or other parties.	● Maintain 12 second eye lead time (1 1/2 blocks in city traffic, 1/4 mile in highway traffic). Assess condition of traffic lights (fresh vs. stale) SECOR/Contractor. ● Assess information from distant objects SECOR/Contractor. ● Adjust eye lead distance to speed SECOR/Contractor. ● Watch for ice on road, slow down before hitting the ice, keep your foot off the brake SECOR/Contractor.
Count - keep your distance		Collision, injury or death to occupants or other parties.	● Maintain safety cushion around vehicle (front, sides, rear) SECOR/Contractor. ● Adjust vehicle space and speed to avoid unsafe intrusion by other drivers SECOR/Contractor. ● At signal controlled intersections, stop 10 feet behind crosswalks or behind other vehicles SECOR/Contractor. ● When stopped, allow vehicle in front to move for 3 seconds before accelerating SECOR/Contractor. ● Observe approaching merge areas and choose lane of least resistance SECOR/Contractor. ● Cede right of way and allow for other vehicles to merge, change lanes, make turns, etc SECOR/Contractor. ● Watch for ice on road, slow down before hitting the ice, keep your foot off the brake SECOR/Contractor.
Have a way OUT.		Collision, injury or death to occupants or other parties.	● Avoid being unnecessarily boxed in SECOR/Contractor. ● Avoid sudden acceleration and deceleration SECOR/Contractor. ● Maintain 1 second for every 10 mph (with 3 second minimum) following distance, adjust speed to traffic conditions, scan immediate and adjacent lanes before merging SECOR/Contractor.
Recognize - make sure others see you.		Collision, injury or death to occupants or other parties.	● Seek eye contact with other drivers SECOR/Contractor. ● Cover or use horn when conditions warrant SECOR/Contractor. ● Before changing lanes, signal well in advance, check mirrors and over shoulder, and allow adequate space before changing lanes SECOR/Contractor. ● Break early to activate brake lights SECOR/Contractor. ● Stay out of blind spots. Gently sound horn or flash lights if unsure other driver sees you SECOR/Contractor. ● Turn on headlamps in high traffic areas, at dusk, and in inclement weather. Do not over drive your headlights SECOR/Contractor. ● Increase the distance between your vehicle and the vehicle in front of you at night SECOR/Contractor.

Backing up		Collision, injury or death to occupants or other parties.	● Make all backing maneuvers slowly and cautiously SECOR/Contractor. ● Check mirrors and over shoulders. When parking, look for pull-through parking to avoid backing SECOR/Contractor. ● If reversing with 2 or more personnel in the vehicle, then at least 1 person must exit the vehicle and act as a spotter. If alone before getting in the car, assess the area looking for approaching pedestrians/vehicles. When clear get in vehicle, do a 360 scan then put in gear. Give 2 short honks of the horn, while looking over your shoulder, slowly back out of the parking space being prepared to apply the brakes if needed SECOR/Contractor.
Pay attention to driving at all times		Collision, injury or death to occupants or other parties.	● Always focus on driving. Stop driving if you become distracted SECOR/Contractor. ● Refrain from conducting involved or emotional discussions while driving - end the conversation or pull over to the side of the road if it becomes difficult to concentrate on driving while conversing with your passengers SECOR/Contractor.
Parking		Collision, injury or death to occupants or other parties.	● Park away from other cars SECOR/Contractor. ● Back into parking spot when possible and safe SECOR/Contractor. ● If reversing with 2 or more personnel in the vehicle, then at least 1 person must exit the vehicle and act as a spotter. If alone before getting in the car, assess the area looking for approaching pedestrians/vehicles. When clear get in vehicle, do a 360 scan then put in gear. Give 2 short honks on the horn, while looking over your shoulder, slowly back out of the parking space being prepared to apply the brakes if needed SECOR/Contractor. ● Maintain cushion of safety from fixed objects. Set parking brake SECOR/Contractor.
POST-TRIP - Report maintenance or mechanical problems upon returning vehicle.		Conditions worsen leading to mechanical failure resulting in accident, injury or death.	● Report vehicle problems immediately to company representative or rental car agency SECOR/Contractor.

Task 2. Well Installation

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	8/4/2005		
			8/4/2005	Michael Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made by			01/05/2007	Chris Armes	
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Visit Site and Identify and mark drilling locations.	Wear reflective vest for traffic, steel toed and puncture resistant soles boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Traffic hazards, overhead and underground installations, product releases, property damage.	●Visit the site and observe the existing conditions - SECOR ●Reference Utility Clearance Review form - SECOR ● Coordinate with Site Manager (or designee) to minimize potential conflicts. - SECOR ● Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc. - SECOR ● Mark out the proposed borehole locations. - SECOR ● Call underground utility locating service for public line location clearance and get list of utilities being contacted. - SECOR ● Coordinate private line locator for private property. - SECOR ● Develop a traffic guidance and control plan with the client and local agencies as applicable. Plan may include use of delineators, barrier tape, jersey barriers, snow fence, etc - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR

Obtain sub-contractor equipment maintenance records prior to commencing work.		Improper equipment maintenance, which can cause equipment failure and possible personal injury.	● Verify records in possession are for equipment on site. - SECOR ● Verify maintenance is current. - SECOR
Best Method of Utility/Subsurface Impediment Clearance Based on Data Researched, Maps Reviewed, Project Work Scope and Site Visual Observation		Selection of inappropriate clearance method resulting in missed subsurface impediment, or could impact near-surface impediment with ruptured utility consequence	● Available methods could include one or a combination of the following: 1) magnetic surveys, 2) ground-penetrating radar, 3) hand-excavation by shovel, trowel, hand-auger or post-hole digger 4) Air-Knife or vacuum excavation technology, 5) Hydraulic excavation. - SECOR ● It should be recognized that pavements may require saw cutting and/or coring to access hole clearance and precautions should be taken related to use of this equipment or be subcontracted by competent and licensed subcontractors specializing in such work. - SECOR ● Clear and concise interaction with field staff performing borehole clearance is a must, and communicate findings from locate and mark services, utility locators and map research. - SECOR
Mobilize with proper equipment/supplies for drilling.	Gather necessary PPE. Reflective vest for traffic, steel toed and puncture resistant sole boots, hard hat, safety glasses with side shields, ear plugs/muffs, leather gloves for the non-chemical aspects of work as necessary; an air purifying respirator with combination organic vapor/P-100 cartridges, and other PPE as needed.	Vehicle accident. Lifting hazards. Delay or improper performance of work due to improper equipment onsite.	● Start project with Daily Production Safety Meeting - SECOR ● Follow safe driving procedures. - SECOR ● Employ safe lifting procedures. - SECOR ● Make sure sub-contractors are aware of their responsibilities for labor, equipment and supplies. - SECOR ● Review permit conditions. - SECOR
Visually clear proposed drilling locations.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Underground and overhead installations.	● Complete Pre-Mobilization section of Utility Clearance Review form (Attachment 4) and adjust drilling locations as necessary. - SECOR

Set up necessary traffic control for method of borehole clearance identified to be used (i.e. geophysical magnetic, radar, air-knife, hydraulic excavations, etc.).	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic guidance and control equipment placement.	● Use buddy system for placing traffic guidance and control equipment. - SECOR ● Implement traffic guidance and control plan such as setting out delineators, snow fence and caution tape defining safety area. - SECOR ● Adhere to approved Traffic Guidance and Control Plans when working in roadways - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR
Coordinate and assist with set up of equipment and/or subcontractor service being used for utility clearance in subsurface investigation area. Take charge of site activities and manage site work and/or subcontractors.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Vehicle accident during rig movement. Damage caused by rig while accessing set-up location. Contact with overhead installations. Soft terrain. Rig movement.	● Rig mast must be down when moving/repositioning rig. - SECOR ● All staff should know where the kill switch is for the drilling rig. - SECOR ● Verify clear pathway to drilling location and clearance for raising mast - SECOR ● Provide as-needed hand signals and guidance to driver to place rig. - SECOR ● Visually inspect rig (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition, pressurized hoses secured with whip-checks or adequate substitute, jacks in good condition?). - SECOR ● If necessary, use wooden blocks under jacks to spread load, and chock wheels. - SECOR
Set up exclusion zone(s) and workstations (drilling and logging/sample collection).	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during set up. Slip, trip and fall hazards.	● Implement exclusion zone set-up. - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Exclusion Zone set up. - SECOR ● Set up workstations with clear walking paths to and from rig. - SECOR ● Use safety tape, snow fence, and/or delineators. - SECOR ● If utilizing Visqueen, (sheet plastic), for sampling area, completely secure Visqueen to the pavement, dirt, etc. with duct tape, delineators, etc. Do not use objects that are hard to notice or could become a trip hazard themselves. - SECOR

Clear upper five to seven feet of borehole using method selected (i.e. hand excavate, air-knife, etc.).	Don required PPE as appropriate for this step: steel toed and puncture resistant sole boots, hard hat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear chemical resistant gloves during handling of soil. Wear an air-purifying respirator with combination organic vapor/P-100 cartridges if necessary.	Back strain, exposure to chemical hazards, hitting an underground utility, repetitive motion.	● Initiate air quality monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available - SECOR ● Stand upwind to avoid exposure whenever possible. - SECOR ● Use the organic vapor monitor/PID aggressively to track the airborne concentration of contaminants close to potential sources such as the core as it is being raised from the hole, the core is opened, etc. - SECOR ● If a hand auger is selected as the hole clearance tool, inform drillers that they may use a mallet to strike the auger bucket to loosen/remove soil. However, one hand should be placed on the connection point between the hand auger bucket and the auger rod and the other hand should be holding the mallet. The hand auger should be secured and stable before using a mallet to remove soil from the auger bucket - SECOR ● Make sure spoils from the hole are properly stored, managed and disposed. - SECOR ● Proceed cautiously and periodically stop to observe conditions in the open hole. Use a high-beam flashlight or mirror to reflect sunlight into the hole for observations. - SECOR ● The diameter of the clearance hole must be at least the diameter of the intended drilling auger or core device. - SECOR ● Care should be exercised in identifying resistance to excavation or recalcitrant objects as they may not appear identifiable until more fully exposed (i.e. you might break a pipe in the process of clearing the hole before you are aware it is a pipe. Go Slowly-Visually Check Frequently). - SECOR ● Evaluate any soil samples inside a Ziploc bag at arm's length. DO NOT EVALUATE THE SAMPLE WITH THE BAG OPEN. THIS WILL AVOID UNNECESSARY EXPOSURE. - SECOR ● Use proper lifting techniques and tools. - SECOR ● Complete the Pre-Drilling section of the Borehole Clearance Review form. - SECOR ● Avoid twisting back during the operation; Decontaminate equipment after use. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums (say where it will be stored). - SECOR

Commence drilling operation.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges if needed. Wear chemical resistant gloves if needed.	Cross-contamination from previous hole. Back strain, heat or cold, eye injury, noise, exposure to chemical hazards, hitting an underground utility, slips, trips and falls, equipment failure.	● Decontaminate sampling after collecting a sample and decontaminate drilling equipment after each borehole. - SECOR ● Use proper lifting techniques. - SECOR ● Conduct air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR ● Monitor drilling progress. - SECOR ● Keep work area clear of tripping or slipping hazards - SECOR ● Perform periodic visual inspections of drill rig. - SECOR
If drilling does not proceed immediately, cover cleared bore holes prior to leaving site	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges if needed. Wear chemical resistant gloves if needed.	Tripping, wrenched ankles, broken limbs, foreign objects or substances introduced into cleared bore holes	● Appropriate methods of covering a cleared bore hole can include 1) steel drive plates affixed to surrounding pavement capable of enduring site traffic without dislocating 2) A sealed 55-gallon steel drum with some soil or water in it to add weight, placed over the bore hole and surrounded by delineator cones or horses (flashers optional) or 3) (preferred method) Backfill open, cleared borehole with clean sand to within 2-inches of surface grade and place compacted asphalt cold-patch matched to surface grade. - SECOR
Collect samples in accordance with sampling plan.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges if needed.	Cross-contamination, improper labeling or storage, exposure to site contaminants	● Evaluate any soil samples inside a Ziploc bag at arm's length. DO NOT EVALUATE THE SAMPLE WITH THE BAG OPEN. THIS WILL AVOID UNNECESSARY EXPOSURE. - SECOR ● Decontaminate sampling equipment between each sampling run. Label samples in accordance with sampling plan. - SECOR ● Keep samples stored in proper containers, at correct temperature, and away from work area. - SECOR ● Conduct air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR

Cuttings will be picked up by shovel and placed directly in 55-gallon drums or other appropriate container.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. If you suspect that equipment is contaminated, wear chemical resistant gloves. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.	Exposure to public. Traffic hazard or obstruction/inconvenience to station operation. Improper storage or disposal. Back strain.	● Have proper storage containment and labeling available onsite. Place materials in isolated location away from traffic and other site functions. - SECOR ● Do not attempt to lift, push or move drums without the proper tools and equipment. - SECOR ● Conduct air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR
Construct well.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Back strain, eye injury, slip, trip and fall hazards. Cross-contamination. Non-approved well construction.	● Use proper lifting techniques. - SECOR ● Keep pathways from well supplies to borehole clear of tripping hazards. - SECOR ● Make sure casing and other materials are clean before going into borehole. - SECOR ● Verify presence or other authorization by any required inspectors for well installation/grouting. - SECOR
Install well vault and set in concrete.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. If you suspect that equipment is contaminated, wear chemical resistant gloves. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.	Back strain, eye injury, skin exposure to concrete, particulate inhalation, slip, trip and fall hazards. Traffic hazards.	● Use proper lifting technique and equipment to install well vault and in concrete preparation. - SECOR ● Complete well vault smooth to grade to eliminate trip hazard (if slightly elevated to prevent storm water intrusion, slope concrete skirt gradually). - SECOR ● Maintain traffic guidance and control and face oncoming traffic. - SECOR ● Perform air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR

Develop well by hand bailing.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.	Physical injury from mechanical failure vacuum truck. Trip hazard. Exposure to contaminants. Cross-contamination. Electric shock. Back strain.	● Make sure equipment is in good working order and pressurized hoses are whip-checked. - SECOR ● If hand bailing; wash hands frequently and keep hands dry, changing gloves as necessary, check condition of your hands frequently, consider using a pump. - SECOR ● Perform air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR ● Keep work area orderly - SECOR ● Decontaminate all equipment going into well. - SECOR ● Any generators must be equipped with GFCI circuit. - SECOR
Gauge water levels and product thickness (where applicable) in wells.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and chemical resistant gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed. Wear chemical resistant suit as needed.	Back strain, inhalation or dermal exposure to chemical hazards, repetitive motion.	● Perform air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location for quick access. - SECOR ● Maintain safe distance from wellhead. - SECOR ● Bend at knees, not at the waist. - SECOR
Purge well(s) and collect purge water. Purging of the wells is typically completed using a hand bailer or vacuum truck. Collected water will be transferred to a 55-gallon drum.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work. If you suspect that equipment is contaminated, wear chemical resistant gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed. Wear chemical resistant suit as needed.	Cross-contamination. Back strain, inhalation or dermal exposure to chemical hazards, slip and fall. Spilling contaminated water.	● Decontaminate purging equipment between each sampling location. Two methods of equipment decontamination will be used on this site. If disposable bailers are used, then they will be properly disposed of. If the bailers are reusable, then they will be washed in an Alconox wash, rinsed with tap water, then rinsed with de-ionized or distilled water. Decontamination water will be transferred to 55-gallon drums and staged - SECOR ● Use proper lifting techniques. - SECOR ● Perform air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR ● Keep work area clear of tripping or slipping hazards. - SECOR ● Store purge water in 55-gallon drums and stage - SECOR

Collect groundwater samples in accordance with sampling plan.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and chemical resistant gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.	Cross-contamination. Back strain, inhalation or dermal exposure to chemical hazards, slip and fall. Improper labeling or storage, injury from broken sample bottle (cuts or acid burn).	● Use proper lifting techniques. - SECOR ● Perform air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location for quick access. - SECOR ● Label samples in accordance with sampling plan. - SECOR ● Keep samples stored in proper containers, at correct temperature, and away from work area. Handle bottles carefully. - SECOR
Dispose or store purge water (if any) onsite.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and chemical resistant gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.	Back strain. Exposure to contaminants. If disposing through onsite treatment system, damage or injury from improper use of equipment. Improper storage or disposal.	● Use proper equipment to transport water (pumps, drum dollies, etc.). - SECOR ● Perform air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location for quick access. - SECOR ● Label storage containers properly, and locate in isolated area away from traffic and other site functions. - SECOR ● Coordinate offsite disposal (where applicable). - SECOR ● Do not attempt to lift, push or move drums without the proper tools or equipment. - SECOR
Supervisor/SHSO must confirm all boreholes are closed, filled in and/or capped.		Possible injuries and damage to property due to stepping into or driving over the well.	● Visually inspect each and every borehole. - SECOR
Clean site/demobilize.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Traffic. Safety hazard left on site. Lifting hazards.	● Use buddy system as necessary to remove traffic guidance and control equipment. - SECOR ● Leave site clean of refuse and debris. - SECOR ● Clearly mark/barricade any borings that need later topping off or curing. - SECOR ● Notify site personnel of departure, final well locations and any cuttings/purge water left onsite. - SECOR ● Use proper lifting techniques - SECOR
Package and deliver samples to lab.	Gloves	Bottle breakage, back strain.	● Handle and pack bottle carefully (bubble wrap bags are helpful). - SECOR ● Package chain of custody inside cooler with samples - SECOR ● Use proper lifting techniques. - SECOR

Task 3. Soil Vapor Extraction System Installation

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	12/3/2003		
			12/3/2003	Michael Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made by			01/05/2007	Chris Armes	
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Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Mobilize with proper equipment/supplies for trenching.	Gather necessary PPE. Reflective vest for traffic, steel toed and puncture resistant sole boots, hard hat, safety glasses with side shields, ear plugs/muffs, leather gloves for the non-chemical aspects of work as necessary; Wear an appropriate air purifying respirator with combination organic vapor/P-100 cartridges, as needed. (Use a full face respirator, nitrile gloves, foam earplugs with an NRR of 33 or their equivalent. Tyvek, poly coated chemical resistant suit or its equivalent).	Traffic hazards, vehicle accident, lifting hazards. Delay or improper performance of work due to improper equipment on site.	● Start project with Production Safety Meeting (Attachment 11) - SECOR ● Follow safe driving procedures. - SECOR ● Employ safe lifting procedures. - SECOR ● Make sure sub-contractors are aware of their responsibilities for labor, equipment and supplies. - SECOR ● Review permit conditions. - SECOR ● Develop a traffic guidance and control plan with the client and/or local agencies as applicable. Plan may include use of delineators, barrier tape, jersey barriers, snow fence, etc. (Include in Attachment 2). - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR

Visually clear the proposed trenching and above-ground structure locations. Mark out the proposed trenching locations.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Traffic hazards, overhead and underground lines & installations, electrocution, explosion, product release, property damage, and interruption of services.	● Review proposed location map in advance of arriving on site. - SECOR ● Complete Pre-Mobilization section of Utility Clearance Review form (Attachment 4) and adjust drilling locations as necessary. - SECOR ● Coordinate with Site Manager (or designee) to minimize potential conflicts. - SECOR
Set up necessary traffic guidance and control equipment, if necessary. See Attachment 2 for detailed plan if available.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic guidance and control equipment placement.	● Use buddy system for placing traffic guidance and control equipment. - SECOR ● Implement traffic guidance and control plan such as setting out delineators, snow fence and caution tape defining safety area. - SECOR ● Adhere to approved Traffic Guidance and Control Plans when working in roadways. (See Attachment 2) - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR
Set up exclusion zone(s).	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during set up. Slip/fall hazards.	● Implement exclusion zone. - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Exclusion Zone set up. - SECOR ● Set up workstations with clear walking paths to and from trenching. - SECOR ● Use safety tape and/or snow fence and delineator. - SECOR
Cut pavement.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, face shield, and leather gloves as necessary. Wear an appropriate air-purifying respirator with combination organic vapor/P-100 cartridges as needed.	Traffic hazard. Contact with utilities. Eye injury from flying debris. Back strain when moving equipment. Noise. Inhalation of particulates.	● Identify and barricade work area. - SECOR ● Avoid underground installations. - SECOR ● Use proper lifting techniques and assistance when moving equipment (lift gate on truck may be necessary). - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR

Excavate trench.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary. Wear an appropriate air-purifying respirator with combination organic vapor/P-100 cartridges as needed.	Injury or accident from heavy equipment. Injury from damaging underground lines. Back strain. Collapse of trench on workers. Vehicle or foot traffic. Falling into open trench. Trip hazards. Struck by equipment. Noise. Exposure to chemical hazards.	● Maintain eye contact with equipment operator. Use agreed-upon hand signals and work paths. - SECOR ● Hand excavate and protect underground lines that are in immediate path of trench. - SECOR ● Use proper lifting technique and back support when hand digging. - SECOR ● Use shoring/benching/sloping of trench walls or trench boxes if workers will have head and shoulders below top of trench (always for >5 ft deep, but may be required for <5 feet as well). - SECOR ● Maintain adequate access/egress locations for workers in trench. - SECOR ● Keep trench covered in non-active work areas and between work shifts. - SECOR ● Heed vehicle backup alarm and establish eye contact with operator. - SECOR ● Keep work area clean, minimizing slip, trip and fall hazard. - SECOR ● Perform air quality monitoring. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR ● NOTE: SECOR staff are not to enter an excavation without first contacting Philip Platcow, Director of Industrial Hygiene and Health & Safety (617) 232-7355. - SECOR
Install Air Sparging and Soil Vapor Extraction hose and piping.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary. Wear an appropriate air-purifying respirator with combination organic vapor/P-100 cartridges as needed.	Collapse of trench on workers. Vehicle or foot traffic. Falling into open trench. Trip hazards. Lifting hazard. Exposure to chemical hazards.	● Use shoring/benching/sloping of trench walls or trench boxes if workers will have head and shoulders below top of trench (always for >5 ft deep, but may be required for <5 feet as well). - SECOR ● Maintain adequate access/egress locations for workers in trench. - SECOR ● Keep trench covered in non-active work areas and between work shifts. Use proper lifting techniques. - SECOR ● Keep work area clean, minimizing slip, trip and fall hazard. - SECOR ● Perform air monitoring. ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR
Pressure-test piping (primary and secondary conduit as required).	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Eye injury.	● Don't overpressurize piping (usually <10 psi). Verify security of end cap. - SECOR

Install electrical line and conduit to well heads.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Collapse of trench on workers. Vehicle or foot traffic. Falling into open trench. Trip hazards. Lifting hazard.	● Use shoring/benching/sloping of trench walls or trench boxes if workers will have head and shoulders below top of trench (always for >5 ft deep, but may be required for <5 feet as well). - SECOR ● Maintain adequate access/egress locations for workers in trench. - SECOR ● Keep trench covered in non-active work areas and between work shifts. - SECOR ● Use proper lifting techniques. - SECOR ● Keep work area clean, minimizing slip, trip and fall hazards. - SECOR
Backfill trench.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Injury from heavy equipment. Leg or foot injury from compaction equipment. Future accidents or damage as a result of subsidence. Traffic hazards.	● Maintain eye contact with equipment operators. - SECOR ● Use agreed-upon hand signals. - SECOR ● Wear proper PPE during compaction. - SECOR ● Perform compaction of backfill in accordance with specification. - SECOR
Place and attach major equipment components.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Injury from transport equipment. Back strain when moving equipment. Eye or hand injury when using power tools.	● Keep clear of equipment when large components are being set in place. - SECOR ● Use mechanical assistance as needed to arrange equipment into place. - SECOR
Connect AS and SVE hose and piping and associated valves, sampling ports, and gauges.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Eye or other injury from use of hand tools. Body position / lifting hazard. Chemical exposure.	● Use proper lifting techniques. - SECOR ● Place wind at your back to avoid inhaling primer or glue vapor. - SECOR
Install electrical control panel, equipment wiring and conduit, and system controls.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Electrical shock/electrocution. Fire from faulty wiring. Back strain when lifting panel into place. Eye or other injury from hand tools.	● Use lock-out/tag-out procedures to isolate main power supply. - SECOR ● Do not perform electrical work in rain. - SECOR ● Keep work surfaces dry, especially standing locations. - SECOR ● Use proper lifting techniques. - SECOR ● Wear proper PPE. - SECOR
Place required labeling and signage.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Emergencies from fire, or rupture of piping or other containment structures.	● Indicate emergency contact and phone #. - SECOR ● Clearly label emergency shut-off. - SECOR ● Properly label any hazardous materials (e.g. H_2O_2, petroleum collection containers, etc.). - SECOR

Supervisor/SHSO must confirm all boreholes are closed, filled in and/or capped.		Possible injuries and damage to property due to stepping into or driving over the well.	● Visually inspect each and every borehole. - SECOR
Clean site/demobilize	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Traffic hazards. Nuisance or safety hazard left on site. Lifting hazards.	● Use buddy system as necessary to remove traffic guidance and control equipment. - SECOR ● Leave site clean of refuse and debris. - SECOR ● Notify station personnel of departure. - SECOR ● Use proper lifting techniques. - SECOR

Task 4. Soil Vapor Sampling

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	10/7/2005		
			10/31/2005	Michael Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made by			01/05/2007	Chris Armes	
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions

Mobilize with proper equipment/supplies.	Gather necessary PPE. Reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, long sleeved shirts, safety glasses with side shields, ear plugs/muffs, and leather gloves for the non-chemical aspects of work as necessary; Wear an air purifying respirator with combination organic vapor/P-100 cartridges, and other PPE as needed. (Use a North 7600 series full face respirator or its equivalent. Best brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek, poly coated chemical resistant suit or its equivalent).	Vehicle accident. Lifting hazards. Delay or improper performance of work due to improper equipment onsite.	● Follow safe driving procedures. - SECOR ● Employ safe lifting procedures. - SECOR ● Review HASP and permit conditions. - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR
Set up necessary traffic control.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeved shirts, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic guidance and control equipment placement.	● Use buddy system for placing traffic guidance and control equipment. - SECOR ● Reference traffic guidance and control plan section of HASP (may include specific requirements based on permits). - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR
Unload and set up equipment.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeved shirts, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle. Trip hazards. Accident when maneuvering equipment. Lifting hazard. Electrical hazard.	● Place equipment away from high traffic areas. - SECOR ● Visually inspect equipment (fire extinguisher on board/available on site, no damaged hoses or electrical lines, pressurized hoses secured with whip-checks or adequate substitute, all vapor and/or water hoses firmly connected, equipment grounded). - SECOR ● Use proper lifting techniques. - SECOR

Commence remedial system monitoring (where applicable).	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeved shirts, hardhat, safety glasses with side shields, and leather gloves as necessary. Wear chemical resistant suit as needed. Wear appropriate chemical resistant gloves as needed. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed. Wear appropriate hearing protection as needed.	Explosion or fire. Trip hazards. Unauthorized release of contaminants. Exposure to contaminants (inhalation, dermal contact). Noise. Electrical hazards.	● Follow equipment-specific operation instructions. - SECOR ● Monitor treatment system vapor and oxygen concentrations if applicable. - SECOR ● Perform air monitoring. - SECOR ● Have appropriate air purifying respirator combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR ● Keep work area clean, minimizing slip, trip and fall hazards. - SECOR ● Monitor treatment system and collect data to ensure discharge is within permit parameters and capacity of any storage containers (concentrations and flow rates). - SECOR
Collect samples in accordance with sampling plan, (where applicable).	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeved shirts, hardhat, safety glasses with side shields, and leather gloves as necessary. Wear chemical resistant suit as needed. Wear appropriate chemical resistant gloves as needed. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed. Wear appropriate hearing protection as needed.	Cross-contamination, improper sample labeling or storage, exposure to site contaminants. Repetitive motion. Body position.	● Label samples in accordance with sampling plan. - SECOR ● Keep samples stored in proper containers, at correct temperature, and away from work area. Minimize splashing when collecting water samples. - SECOR ● Perform air monitoring. - SECOR ● Have appropriate air purifying respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR ● Decontaminate sampling equipment after collecting each sample. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums in a location mutually agreed upon with the Facility Manager. - SECOR
Clean site/demobilize	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeved shirts, hardhat, safety glasses with side shields, and leather gloves as necessary.	Traffic hazard. Lifting hazards. Safety hazard left on site.	● Use buddy system as necessary to remove traffic guidance and control equipment. - SECOR ● Use proper lifting techniques. - SECOR ● Leave site clean of refuse and debris. - SECOR
Supervisor/SHSO must confirm all wells are closed, and/or capped and compound is secure.		Possible injuries and damage to property due to stepping into or driving over the well.	● Visually inspect each and every well. - SECOR
Package and deliver samples to lab		Bottle breakage, back strain.	● Handle and pack bottles carefully (bubble wrap bags are helpful). - SECOR ● Use proper lifting techniques. - SECOR

Task 5. Chemical Placement

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	12/3/2003	Dave Vasquez	Office Health and Safety Coordinator
				Chris Armes	Project Geologist
			01/05/2007	Michael Allen Philipp	West Region H & S Manager
		Site specific edits to this JSA were made by	01/05/2007	Chris Armes	Project Geologist
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
HRC-X must be heated in a hot water bath or diluted with hot water to improve the viscosity of the HRC-X material for direct push injection.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeve shirts, hardhat, safety glasses with side shields, and leather gloves as necessary.	Hot water handling, improper equipment procedures, heat source hazard.	• The buckets used to package the HRC-X product should not be heated directly, another medium such as water must be used so that the physical structure of the buckets is not jeopardized – Contractor. • Heat up water using a heated pressure washer, stream cleaner, camping stove or propane tank. – Contractor. • If using a hot water bath to raise the temperature of the HRC-X product, add hot water (160^{o}F) to a large trough and then place the buckets of HRC-X in the hot water bath. The HRC-X should be heated to 110^{o}F for optimal product handling and pump injection. - Contractor. • If using hot water to heat and dilute the HRC-X product, mix hot water with the HRC-X product in a large container. Follow the manufacturer instructions for diluting the HRC-X product to obtain optimal product handling and pump injection. – Contractor.

Use a pump that has a pressure rating of at least 1,500 pounds per square inch (psi) and a delivery rate of 3 gallons per minute (recommended).		Improper equipment maintenance, which can cause equipment failure and possible personal injury.	● Verify records in possession are for equipment on site. – SECOR. ● Verify maintenance is current. – SECOR.
Clear direct push locations. The drilling contractor will contact JULIE before drilling. Facility representatives will be present to help confirm the location of private utilities.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeve shirts, hardhat, safety glasses with side shields, and leather gloves as necessary.	Traffic hazards, overhead and underground installations, product releases, property damage, dealer inconvenience.	● Reference Utility Clearance Review form (**Attachment 4**). - SECOR ● Coordinate with Site Manger (or designee) to minimize potential conflicts. – SECOR. ● Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc. – SECOR. ● Mark out the proposed direct push locations. – SECOR. ● Call underground utility locating service for public line location clearance and get list of utilities being contacted. If necessary, coordinate private line locator for private property. – SECOR. ● Develop a traffic guidance and control plan with the client and local agencies as applicable. Plan may include use of delineators, barricades, caution tape, construction fence, jersey barriers, etc. *(Refer to* **Attachment 2***)*. – SECOR. ● **It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. Ensure that you challenge any "Traffic Guidance and Control Plan" developed by an outside "expert". – SECOR.**
Obtain sub-contractor equipment maintenance records prior to commencing work.		Improper equipment maintenance, which can cause equipment failure and possible personal injury.	● Verify records in possession are for equipment on site. – SECOR. ● Verify maintenance is current. – SECOR.

Mobilize with proper equipment/supplies for direct push.	Gather necessary PPE. Reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeve shirt, hard hat, safety glasses with side shields, ear plugs/muffs, leather gloves for the non-chemical aspects of work as necessary; Wear an air purifying respirator with combination organic vapor/ P-100 cartridges, and other PPE as needed. (*Use a North 7600 series full face respirator or its equivalent. Ansell Edmont brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek, poly coated chemical resistant suit or its equivalent).*	Vehicle accident. Lifting hazards. Delay or improper performance of work due to improper equipment onsite.	• Start project with Production Safety Meeting (**Attachment 6**). – SECOR. Discuss: -Ensure all SECOR/Client permits are filled out appropriately and discussed. - SECOR. -potential hazards and ways to avoid them. - SECOR/Contractor. - motor vehicle safety topic. - SECOR/Contractor. - current days weather conditions. - SECOR/Contractor. - PPE requirements. - SECOR/Contractor. - check subcontractors HASP, Certs, MSDS's, and equipment maintenance records. - SECOR. - using safe lifting procedures. - SECOR/Contractor. • Follow safe driving procedures. – SECOR/contractor. • Employ safe lifting procedures. – SECOR/contractor. • Make sure sub-contractors are aware of their responsibilities for labor, equipment and supplies. – SECOR. • Review permit conditions. – SECOR.
Visually clear proposed direct push locations.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Underground and overhead installations.	• Complete Subsurface Clearance Log form (**Attachment 4**) and adjust drilling locations as necessary – SECOR.
Set up necessary traffic guidance and control equipment. See **Attachment 2** for detailed plan.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic control equipment placement.	• Use buddy system for placing traffic guidance and control equipment. – SECOR/contractor. • Implement traffic guidance and control plan such as setting out delineators, construction fence and/or caution tape defining safety area. -SECOR/contractor. • Adhere to approved Traffic Guidance and Control Plans, especially when working in roadways. – SECOR/contractor. • **It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. Ensure that you challenge any "Traffic Guidance and Control Plan" developed by an outside "expert". - SECOR.**

Assist with set up of rig.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Vehicle accident during rig movement. Damage caused by rig while accessing set-up location. Contact with overhead installations. Soft terrain. Rig movement.	● Rig mast must be down when moving/repositioning rig. – SECOR/contractor. ● All staff should know where the kill switch is for the drilling rig. – SECOR/contractor. ● Verify clear pathway to drilling location and clearance for raising mast. – SECOR/contractor. ● Provide as-needed hand signals and guidance to driver to place rig. – SECOR/contractor. ● Visually inspect rig with contractor foreman (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition, pressurized hoses secured with whip-checks or adequate substitute, jacks in good condition). – SECOR/contractor. ● If necessary, use wooden blocks under jacks to spread load. Chock wheels. – SECOR/contractor.
Set up exclusion zone(s) and workstations (drilling and logging/sample collection).	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, long sleeve shirt, hardhat, safety glasses with side shields, and leather gloves as necessary.	Struck by vehicle during set up. Slip, trip and fall hazards.	● Implement exclusion zone set-up. **It is the responsibility of the SHSO to annotate the Site Plan with the Exclusion Zone set up. - SECOR.** ● Set up workstations with clear walking paths to and from rig. Use safety tape and delineators. – SECOR/contractor. ● If utilizing Visqueen, (sheet plastic), for sampling area, completely secure Visqueen to the pavement, dirt, etc. with duct tape, delineators, etc. Do not use objects that are hard to notice or could become a trip hazard themselves. – SECOR/contractor.

Clear upper five feet of drilling location using post-hole digger or hand auger or acceptable alternative. Ensure that you have gone five feet. Then use a probe. Check to the entire diameter of the drill auger.	Don required PPE as appropriate for this step: steel toed and puncture resistant sole boots, long sleeve shirt, hard hat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear chemical resistant gloves during handling of soil. Wear an air-purifying respirator with combination organic vapor/P-100 cartridges if necessary. (*Use a North 7600 series full face respirator or its equivalent. Ansell Edmont brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek poly coated suit or its equivalent).*	Back strain, exposure to chemical hazards, hitting an underground utility, repetitive motion.	● Initiate air quality monitoring as outlined in **Section 12. - SECOR.** ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR. ● Stand upwind to avoid exposure whenever possible. – SECOR/contractor. ● Use the organic vapor monitor aggressively to track the airborne concentration of contaminants close to potential sources such as the core as it is being raised from the hole, the core is opened, etc. - SECOR. ● Evaluate any soil samples inside a Ziploc bag at arm's length. DO NOT EVALUATE THE SAMPLE WITH THE BAG OPEN. THIS WILL AVOID UNNECESSARY EXPOSURE. - SECOR. ● Use proper lifting techniques and tools. – SECOR/contractor. ● Check the Subsurface Clearance Log form (See **Attachment 4).** - SECOR. ● Avoid twisting back during the operation; Decontaminate equipment after use. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums in the South Alley. – SECOR/contractor.
Commence direct push operation. The drive rod assembly should be fitted with a disposable tip on the first drive rod and pushed down to the desired depth. Drive rods should have a minimum inside diameter of 0.625-inches.	Steel toed and puncture resistant sole boots, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/ P-100 cartridges if needed. Wear chemical resistant gloves if needed.	Cross-contamination from previous hole. Back strain, heat or cold, eye injury, noise, exposure to chemical hazards, hitting an underground utility, slips, trips and falls, equipment failure.	● Decontaminate direct push equipment after each borehole. – SECOR/contractor. ● Use proper lifting techniques. – SECOR/contractor. ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of work area, readily available. - SECOR. ● Monitor direct push progress. - SECOR. ● Keep work area clear of tripping or slipping hazards. – SECOR/contractor. ● Perform periodic visual inspections of drill rig. – SECOR/contractor.

The heated or diluted HRC-X product should be poured into the pump's hopper or positioned near the intake hose of the pump. A sub-assembly connecting the delivery hose to the drive rods and pump should be used. The sub-assembly should be constructed in a manner that allows for the drive rods to be withdrawn while the material is being pumped.	Steel toed and puncture resistant sole boots, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. Wear appropriate air purifying respirator with combination organic vapor/ P-100 cartridges if needed. Wear chemical resistant gloves if needed.	Splashing of heated HRC-X product. Back strain, skin burns, slips, trips and falls.	• Use proper lifting techniques. – SECOR/contractor. • Monitor the pump injection process. – SECOR.
Perform personnel dry decontamination procedures.		Chemical exposure.	• Perform dry boot wash using a stiff bristle, fiberglass handled brush paying special attention to the welt and sole areas of the boot. Remove tape from boot tops and properly dispose of the tape, remove tape from outer gloves and properly dispose of the tape, remove outer gloves and properly dispose of outer gloves, remove Tyvek and properly dispose of Tyvek, remove boots and place in large garbage bag, remove inner gloves and properly dispose of inner gloves. Put street shoes on. Wash hands, face, arms and neck (any exposed skin) (use baby wipes if a washing facility is unavailable) Decontamination water will be stored in 55 gallon drums. - SECOR. • **Drums will be staged in a location determined by the SHSO and the Property Owner/Station Manager.** - SECOR**.** • **Drums containing flammable/combustible liquids or solids must be grounded and if there are multiple drums bonded together.** - SECOR**.** • **Use extreme care when opening the bung caps. Stand an arms length away and open the bung slowly to relieve any built up pressure.** - SECOR**.**
Supervisor/SHSO must confirm all boreholes are closed, filled in and/or capped.		Possible injuries and damage to property due to stepping into or driving over the well.	• Visually inspect each and every borehole. - SECOR.

Clean site/demobilize.	Steel toed and shank shoes, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Traffic. Safety hazard left on site. Lifting hazards.	• Use buddy system as necessary to remove traffic control. - SECOR/Contractor. • Leave site clean of refuse and debris. - SECOR/Contractor. • Clearly mark/barricade any borings that need later topping off or curing. - SECOR/Contractor. • Notify site personnel of departure, final well locations and any cuttings/purge water left onsite. - SECOR. • Use proper lifting techniques. - SECOR/Contractor. • Use a mechanical aid or other colleague, as appropriate to help lift weights over 50lbs. - SECOR/Contractor. • Be aware of sharp edges on equipment. - SECOR/Contractor. • Ensure that all waste containers are closed before moving them. - SECOR/Contractor. Do not jump off the back of the pick-up. - SECOR/Contractor.

Task 6. Groundwater Sampling

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	2/2/2006		
			3/8/2006	Eric Miller	RE Support #3 Purity and BeeJay Scales
Site specific edits to this JSA were made by			01/05/2007	Chris Armes	Project Geologist
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
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Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions

Mobilize with proper equipment/supplies for sampling.	Gather necessary equipment and supplies: Scope of Work, or sampling plan HASP, including Journey Management Plan, Steel-toed and puncture resistant boots, Long sleeve shirt. Hardhat, Hearing protection (NRR 33), if needed Full Face Respirator with organic vapor/P-100 combo cartridges, Safety glasses and Safety Sun Glasses, Leather work gloves Chemical resistant gloves and Tyvek. Safety Vest, Sun block/Insect Repellant, First Aid & Blood borne Path. Kit, Eye Wash Bottle, Fire Extinguisher	Back or muscle strain (lifting hazard), Motor Vehicle Crash Delay or improper performance of work due to improper equipment onsite. Exposure to broken glass Injury from material handling	● Conduct Plan Prevent Execute/Self Assessment Safe Performance procedures. - SECOR/Contractor. ● Assess the site for slip/trip/fall hazards, biological and chemical hazards, unsafe conditions, traffic hazards, etc. - SECOR/Contractor ● Take your time. Do not rush. - SECOR/Contractor. ● Start project with Daily Production Safety Meeting (Attachment 11). - SECOR/Contractor ● Potential hazards and ways to avoid them. - SECOR/Contractor. ● Motor vehicle safety topic. - SECOR/Contractor ● Current days weather conditions. - SECOR/Contractor ● PPE requirements. - SECOR/Contractor ● Check subcontractors HASP, Certs, MSDSs, and equipment maintenance records as applicable. - SECOR ● Follow safe driving procedures. - SECOR/Contractor ● Employ proper lifting and bending procedures. - SECOR/Contractor ● Wear safety glasses and leather work gloves when loading, unloading, and whenever material handling. - SECOR/Contractor. ● Secure load in vehicle. - SECOR/Contractor. ● Use lids to debris/garbage containers. Do not leave buckets open without a lid! Material in the bucket can spill. - SECOR/Contractor. ● Use bubble wrap or other insulating material to cushion the sample containers during transport. - SECOR/Contractor ● Use the right tools to open and close well boxes. Wear leather work gloves when opening the well boxes. - SECOR/Contractor ● Wear leather gloves when walking/working in areas with brush or other undergrowth. - SECOR/Contractor.
Set up necessary traffic control.	Wear reflective traffic vest, steel toed and puncture resistant boots, long sleeve shirt, hardhat.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic control equipment placement.	● Use buddy system for placing traffic control. - SECOR/Contractor ● Reference traffic control plan (See Attachment 2). - SECOR/Contractor ● It is the responsibility of the Supervisor / SHSO to annotate the Site Plan with the Traffic Control configuration if an Approved Traffic Control Plan is not available. - SECOR.
Set up exclusion zone(s).	Wear reflective traffic vest, steel toed and resistant sole boots, long sleeve shirt, hardhat.	Struck by vehicle. Slip and fall hazards to workers.	● Implement exclusion zone set-up instructions. - SECOR/Contractor. ● It is the responsibility of the Supervisor / SHSO to annotate the site Plan with the Exclusion Zone configuration. - SECOR. ● Set up clear walking paths between workstations. - SECOR/Contractor

Gauge water levels and product thickness (where applicable) in wells.	Don required PPE as appropriate for this step: steel toed and resistant sole boots, long sleeve shirt, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, leather gloves for the non-chemical aspects of work as necessary. Wear chemical resistant gloves during handling of soil. Wear an air-purifying respirator with combination organic vapor/P-100 cartridges as necessary.	Back strain, inhalation or dermal exposure to chemical hazards, repetitive motion	● Initiate air quality monitoring in accordance with Section 12. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3 to 5 feet of working location, readily available. - SECOR/Contractor. ● Maintain safe distance from wellhead. - SECOR/Contractor. ● Use proper lifting techniques. - SECOR/Contractor. ● Decontaminate equipment between each measurement. - SECOR/Contractor.
Purge well(s) and collect purge water. Purging of the wells is typically completed using a hand bailer. Collected water will be transferred to a 55-gallon drum or other appropriate container.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work. If you suspect that equipment is contaminated, wear chemical resistant gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed. Wear chemical resistant suit as needed.	Cross-contamination. Back strain, inhalation or dermal exposure to chemical hazards, slip and fall. Spilling contaminated water.	● Decontaminate purging equipment between each sampling location. Two methods of equipment decontamination will be used on this site. If disposable bailers are used, then they will be properly disposed of. If the bailers are reusable, then they will be washed in an Alconox wash, rinsed with tap water, then rinsed with de-ionized or distilled water. Decontamination water will be transferred to 55-gallon drums and staged. - SECOR ● Use proper lifting techniques. - SECOR ● Perform air monitoring. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR ● Keep work area clear of tripping or slipping hazards. - SECOR ● Store purge water in 55-gallon drums and stage. - SECOR
Collect groundwater samples in accordance with sampling plan.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and chemical resistant gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.	Cross-contamination. Back strain, inhalation or dermal exposure to chemical hazards, slip and fall. Improper labeling or storage, injury from broken sample bottle (cuts or acid burn).	● Use proper lifting techniques. - SECOR ● Perform air monitoring - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location for quick access. - SECOR ● Label samples in accordance with sampling plan. - SECOR ● Keep samples stored in proper containers, at correct temperature, and away from work area. Handle bottles carefully. - SECOR

Proper clean up and disposal of broken sample container.	Safety glasses. Leather Work Gloves. Long Sleeve Shirt. Hand Broom and Dust Pan. A receptacle for the broken glass (something to contain the broken glass) such as a double garbage bag, a box, or bucket.	Exposure to broken glass and acid (from water preservation acids)Injury	● Isolate area where broken glass is located - SECOR/Contractor. ● Determine if the sample container was preserved (did it have preservative acid in it?) - SECOR/Contractor. ● Determine what to contain the broken glass in, and where to dispose of the broken glass before beginning to pick up the glass. - SECOR/Contractor. ● Collect equipment needed to clean up and contain the broken glass. – SECOR/ Contractor ● Minimize picking up broken glass pieces with your gloved hands. Use a dust pan if possible/practical. - SECOR/Contractor. ● If broken glass is located inside a container (i.e. box), to the extent practical, leave glass inside box and put entire box into a garbage bag. Double bag if warranted. Place into dumpster. - SECOR/Contractor. ● If broken glass is inside a cooler, remove all other sample containers and place in a safe location, then use hand broom and dust pan to sweep up glass in cooler. - SECOR/Contractor. ● After clean up is complete, contact your Project Manager to report this Near Miss/ Loss. - SECOR/Contractor.
Dispose or store purge water (if any) onsite.	Steel toed and resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary. If you suspect that equipment is contaminated, wear chemical resistant gloves. Wear appropriate air-purifying respirator with combination organic vapor / P-100 cartridges as needed. Wear appropriate chemical resistant suit as needed.	Back strain. Exposure to contaminants. If disposing through onsite treatment system, damage or injury from improper use of equipment. Improper storage or disposal.	● Use proper equipment to transport water (pumps, drum dollies, etc.) - SECOR/Contractor. ● Perform air monitoring in accordance with Section 12. - SECOR. ● Have appropriate respirator with combination organic vapor P-100 cartridges within 3 - 5 feet of working location, readily available. - SECOR/Contractor. ● Label storage containers properly, and locate in isolated area away from traffic and other site functions. - SECOR/Contractor. ● Coordinate offsite disposal (where applicable). - SECOR. ● Do not attempt to lift, push or move drums without the proper tools or equipment. - SECOR/Contractor. ● Store purge water in 55-gallon drums. Stage drums on border of empty lot. - SECOR/Contractor. ● Drums containing flammable/combustible liquids or solids must be grounded and if there are multiple drums bonded together. - SECOR. ● Use extreme care when opening the bung caps. Stand an arms length away and open the bung slowly to relieve any built up pressure. - SECOR/Contractor.
Supervisor/SHSO must confirm all boreholes/monitoring wells are closed, filled in and/or capped.	Steel toed and resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Possible injuries and damage to property due to stepping into or driving over the well.	● Visually inspect each and every borehole/monitoring well. - SECOR/Contractor.

Clean site/demobilize.	Steel toed and resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Traffic. Safety hazard left on site. Lifting hazard. Sharp equipment, broken glass, heavy equipment.	● Use buddy system as necessary to remove traffic control. - SECOR/Contractor. ● Leave site clean of refuse and debris. - SECOR/Contractor. ● Notify station personnel of departure. - SECOR. ● Use proper lifting techniques or use mechanical assistance. - SECOR/Contractor. ● Use a mechanical aid or other colleague, as appropriate to help lift weights over 50lbs. - SECOR/Contractor. ● Be careful of sharp edges on equipment. - SECOR/Contractor. ● Ensure that all waste containers are closed before moving them. - SECOR/Contractor. ● Do not jump off the back of the pick-up. - SECOR/Contractor.
Package and deliver samples to lab.	Nitrile gloves, Heavy leather gloves if bottles are broken.	Bottle breakage, back strain.	● Handle and pack bottle carefully (bubble wrap bags are helpful). - SECOR. ● Use proper lifting techniques. - SECOR/Contractor. ● Broken glass shall be placed in a container with a secure lid and disposed on site whenever possible. - SECOR/Contractor. ● Heavy leather gloves shall be worn when handling broken glass. DO NOT PICK UP BROKEN GLASS WITH YOUR HANDS. USE A BROOM AND DUST PAN! - SECOR/Contractor.

Task 7. Well Abandonment

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	12/3/2003		
			10/24/2005	Michael Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made by			11/15/06	Chris Armes	Project Geologist
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Clear drilling locations.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, leather gloves.	Traffic hazards, overhead and underground installations, property damage, facility inconvenience.	● Reference Utility Clearance Review form. - SECOR ● Coordinate with Site Manger (or designee) to minimize potential conflicts. - SECOR ● Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc. - SECOR ● Mark out the proposed borehole locations. - SECOR ● Call underground utility locating service for public line location clearance and get list of utilities being contacted. If necessary, coordinate private line locator for private property. - SECOR ● Develop a traffic guidance and control plan with the client and local agencies as applicable. Plan may include use of delineators, snow fence, barrier tape, jersey barriers, etc. - SECOR
Obtain sub-contractor equipment maintenance records prior to commencing work.		Improper equipment maintenance, which can cause equipment failure and possible personal injury.	● Verify records in possession are for equipment on site. - SECOR ● Verify maintenance is current. - SECOR

Mobilize with proper equipment/supplies for drilling.	Gather necessary PPE. Reflective vest for traffic, steel toed and puncture resistant sole boots, hard hat, safety glasses with side shields, ear plugs/muffs, leather gloves for the non-chemical aspects of work; chemical resistant gloves, full-face respirator with organic vapor/P-100 cartridges, and other PPE as needed.	Vehicle accident. Lifting hazards. Delay or improper performance of work due to improper equipment onsite.	● Start project with Production Safety Meeting. - SECOR ● Follow safe driving procedures. - SECOR ● Employ safe lifting procedures. - SECOR ● Make sure sub-contractors are aware of their responsibilities for labor, equipment and supplies. - SECOR ● Review permit conditions. - SECOR
Visually clear proposed drilling locations.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, leather gloves.	Underground and overhead installations.	● Complete Pre-Mobilization section of Utility Clearance Review form and adjust drilling locations as necessary. - SECOR
Set up necessary traffic guidance and control equipment.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, leather gloves.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic guidance and control equipment placement.	● Use buddy system for placing traffic guidance and control equipment. - SECOR ● Adhere to approved Traffic Guidance and Control Plans when working in roadways. - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR
Assist with set up of rig.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, leather gloves.	Vehicle accident during rig movement. Damage caused by rig while accessing set-up location. Contact with overhead installations. Soft terrain. Rig movement.	● All staff should know where the kill switch is for the drilling rig. - SECOR ● Verify clear pathway to drilling location and clearance for raising mast. - SECOR ● Provide as-needed hand signals and guidance to driver to place rig. - SECOR ● Visually inspect rig (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition, pressurized hoses secured with whip-checks or adequate substitute, jacks in good condition). - SECOR ● If necessary, use wooden blocks under jacks to spread load and chock wheels. - SECOR
Set up exclusion zone(s) and workstations.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, leather gloves.	Struck by vehicle during set up. Slip/fall hazards.	● Implement exclusion zone set-up. It is the responsibility of the SHSO to annotate the Site Plan with the exclusion zone configuration. - SECOR ● Set up workstations with clear walking paths to and from rig. - SECOR ● Use safety tape, snow fence and delineators. - SECOR

Cuttings will be picked up by shovel and placed directly in 55-gallon drums.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, leather gloves for the non-chemical aspects of work. If you suspect that equipment is contaminated, wear chemical resistant gloves.	Exposure to public. Traffic hazard or obstruction/inconvenience to facility operation. Improper storage or disposal. Lifting hazards. Back strains.	● Have proper storage containment and labeling available onsite. – SECOR/Contractor. ● Place materials in isolated location away from traffic and other site functions. - SECOR/Contractor. ● Drums will be staged (say where drums will be staged). - SECOR/Contractor. ● Do not attempt to lift, push or move drums without the proper tools or equipment. - SECOR/Contractor.
Backfill borehole.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, leather gloves for the non-chemical aspects of work.	Improper grouting can lead to future vertical conduit for contaminant migration. Back strain, trip hazards, eye injury from splashing or release of pressurized grout.	● Mix grout to specification and completely fill the hole. - SECOR ● Use proper lifting techniques. - SECOR ● Keep work area clear of tripping hazards. - SECOR ● Verify presence or other authorization by required inspectors for grouting. - SECOR
Supervisor/SHSO must confirm all boreholes are closed, filled in and/or capped.		Possible injuries and damage to property due to stepping into or driving over the well.	● Visually inspect each and every borehole. - SECOR
Clean site/demobilize.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, leather gloves for the non-chemical aspects of work.	Traffic. Safety hazard left on site. Lifting hazards.	● Use buddy system as necessary to remove traffic guidance and control equipment. - SECOR ● Leave site clean of refuse and debris. - SECOR ● Clearly mark/barricade any borings that need later topping off or curing. - SECOR ● Notify site personnel of departure, final well locations and any cuttings/purge water left onsite. - SECOR ● Use proper lifting techniques. - SECOR

Task 8. Soil Excavation

POC	Development Team	Position/Title	Date	Reviewed By	Position/Title
X	Michael Philipp	West Region Health and Safety Manager	12/3/2003		
			12/3/2003	Michael Philipp	West Region Health and Safety Manager
Site specific edits to this JSA were made by			11/15/06	Chris Armes	Project Geologist
If most recent review date is more than six months old, then this JSA must be updated and reviewed again to remain current					
POC is the JSA development 'Point Of Contact'					

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g. site managers, inspectors, clients, subcontractors, etc.). A tailgate safety meeting must be performed and documented at the beginning of each workday. Plan, Prevent, Execute (PPE)/Safe Performance Self Assessment (SPSA) procedures must be used throughout the project. Weather conditions (heat, cold, rain, lightning) must also be considered. Each employee is empowered, expected, and has the responsibility to stop the work performed by him/herself or another co-worker if the working conditions or behaviors are considered unsafe. All employees should act proactively to identify and mitigate hazards to the safest extent of their ability.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions

Clear excavation locations.	Gather necessary PPE. Reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, ear plugs/muffs, and leather gloves for the non-chemical aspects of work; Wear an air purifying respirator with combination organic vapor/P-100 cartridges, and other PPE as needed. (Use a North 7600 series full face respirator or its equivalent. Best brand nitrile gloves or their equivalent. Howard Leight Max foam earplugs with an NRR of 33 or their equivalent. Tyvek, poly coated chemical resistant suit or its equivalent).	Traffic hazards, overhead and underground installations, property damage, facility inconvenience.	● Reference Utility Clearance Review form (Attachment 4). - SECOR ● Coordinate with Site Manager (or designee) to minimize potential conflicts. - SECOR ● Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc. - SECOR ● Mark out the proposed excavation locations. - SECOR ● Call underground utility locating service for public line location clearance and get list of utilities being contacted. If necessary, coordinate private line locator for private property. - SECOR ● Develop a traffic guidance and control plan with the client and local agencies as applicable. Plan may include use of delineators, barrier tape, jersey barriers, snow fence, etc. (Refer to Attachment 2). - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and Control Plan is not available. - SECOR
Obtain sub-contractor equipment maintenance records prior to commencing work.		Improper equipment maintenance, which can cause equipment failure and possible personal injury.	● Verify records in possession are for equipment on site. - SECOR ● Verify maintenance is current. - SECOR
Set up necessary traffic guidance and control equipment. See Attachment 2 for detailed plan.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Potentially can be struck by vehicle during placement. Vehicle accident as a result of improper traffic control equipment placement.	● Use buddy system for placing traffic guidance and control equipment. - SECOR ● Create a traffic guidance and control plan to address traffic issues. Refer to section above and Traffic Guidance and Control Plan drawing in Attachment 2. - SECOR ● Adhere to approved Traffic Guidance and Control Plans when working in roadways. - SECOR ● It is the responsibility of the SHSO to annotate the Site Plan with the Traffic Guidance and Control configuration if a formally developed Traffic Guidance and control Plan is not available. - SECOR
Set up exclusion zone(s), stockpile area and establish work areas/heavy equipment pathways.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary.	Injury or exposure to public or other onsite personnel. Slip/fall hazards. Onsite vehicular accident with heavy equipment.	● Set up exclusion zones. - SECOR ● It is the responsibility of the SHSO to annotate the site plan with the location of the exclusion zone(s). - SECOR ● Set up clear walking paths between workstations. - SECOR ● Use safety tape, snow fence and delineators. - SECOR

Hand digging/post-holing where necessary to expose and protect underground installations as needed.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as necessary.	Damage to lines (and associated physical hazards or property damage). Back strain. Injury or vehicle damage from falling into holes.	● Use hand tools whenever possible. - SECOR ● Use proper lifting techniques. - SECOR ● Barricade/cover trenches until job is complete. - SECOR ● Conduct air monitoring as outlined in Section 12. Include Lower Explosive Limit (LEL) and oxygen monitoring. If >10% LEL or O_2 < 19.5%, discontinue work or ventilate area with explosion-proof equipment. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR ● Avoid twisting back during post holing. - SECOR ● If necessary, decontaminate equipment after use. Decontamination will be accomplished by an Alconox wash with tap water rinse followed by a de-ionized or distilled water rinse. Collect rinse water in 5 gallon buckets and transfer to 55-gallon drums and stage drums in a position agreed upon by the SECOR SHSO and the Facility Representative. - SECOR
Assist with set up of heavy equipment.	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection devices, and leather gloves as necessary.	Damage caused by heavy equipment while accessing set-up location. Struck by equipment.	● Verify clear pathway to excavation and stockpiling locations. - SECOR ● Provide (as needed) hand signal directions and guidance to driver to place rig. - SECOR ● Visually inspect equipment (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition, pressurized hoses secured with whip-checks or adequate substitute, jacks in good condition). - SECOR ● Maintain eye contact with operator; check all blind spots and use agreed upon hand signals. - SECOR

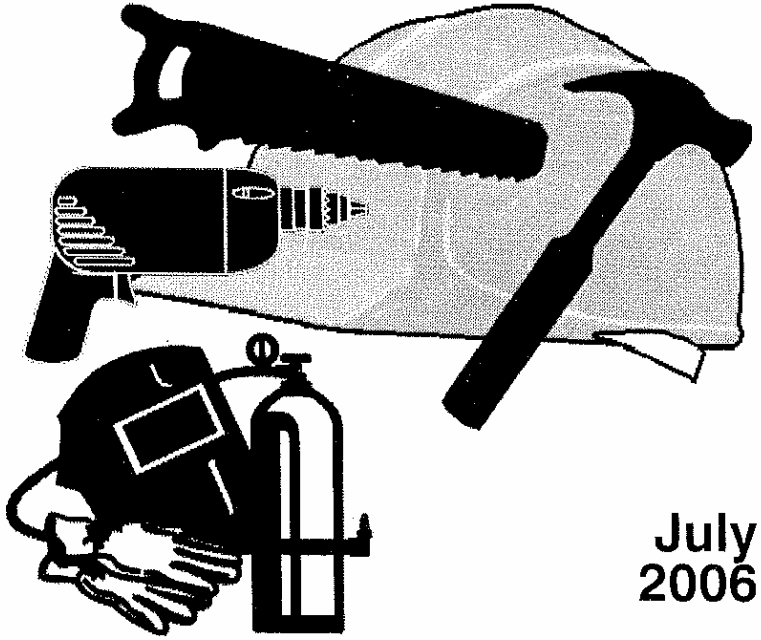
Commence excavation	Wear reflective vest for traffic, steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, and leather gloves as necessary. Wear an appropriate air-purifying respirator with combination organic vapor/P-100 cartridges as needed.	Heat or cold exposure, exposure to chemical hazards, hitting an underground or overhead utility, flammable or oxygen-deficient atmosphere from accumulated vapors, trip and fall, side wall cave-in, equipment failure, noise.	● Monitor weather conditions and take breaks as needed for cold or hot weather. - SECOR ● Conduct air monitoring as outlined in Section 12. Include Lower Explosive Limit (LEL) and oxygen monitoring. If >10% LEL or O_2 < 19.5%, discontinue work or ventilate area with explosion-proof equipment. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR ● Maintain required trench/excavation setbacks for workers and equipment and monitor stability of sidewalls and surrounding ground conditions. - SECOR ● Keep work area clear of tripping or slipping hazards. - SECOR ● Perform periodic visual inspections of heavy equipment and keep it at least 5' from trench/excavation edge, or one foot away from the edge for every foot of depth if greater than 5' deep. - SECOR ● Perform necessary soil classification. - SECOR ● Slope/bench walls or shore excavation to prevent cave-in. - SECOR ● Keep all spoils > 2 ft from excavation edge. - SECOR ● Keep excavation entry controlled and equipped with required ladders and crosswalks. - SECOR ● Suppress odors and vapors as necessary by spraying with Simple Green solution or other approved vapor suppressant or change work processes. - SECOR ● NOTE: SECOR staff are not to enter an excavation without first contacting Philip Platcow, Director of Industrial Hygiene and Health & Safety (617) 232-7355. - SECOR
Collect samples in accordance with sampling plan, as required.	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and chemical resistant gloves as necessary. Wear appropriate respirator with combination organic vapor/P-100 cartridges as needed.	Cave-in of sidewalls if entering excavation. Injury from heavy equipment. Exposure to site contaminants.	● Stay out of excavation, (collect samples from backhoe bucket). - SECOR ● Use agreed-upon hand signals with heavy equipment operators. - SECOR ● Monitor air around excavation in accordance with Section 12. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR

Store excavated materials properly in accordance with site-specific requirements	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and chemical resistant gloves and suit.	Exposure to public. Traffic hazard or obstruction/inconvenience to station operation. Improper storage or disposal.	● Monitor air around excavation in accordance with Section 12. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR ● Have proper storage containment and labeling available onsite. - SECOR ● Place materials in isolated location away from traffic and other site functions. - SECOR ● Stockpile excavated materials on suitable plastic or in appropriately designed container. Cover with plastic and barricade access to waste in accordance with local regulations. - SECOR ● Suppress odors and vapors as necessary by spraying with Simple Green solution or other approved vapor suppressant. - SECOR ● Coordinate proper disposal offsite (where applicable). - SECOR
Backfill trench/excavation	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work and chemical resistant inner gloves as necessary. Wear appropriate air purifying respirator with combination organic vapor/P-100 cartridges as needed.	Struck by heavy equipment. Sidewall collapse. Future damage or accidents resulting from subsidence.	● Use agreed-upon hand signals with heavy equipment operators. - SECOR ● Compact soils to meet specifications. - SECOR ● Maintain eye contact with equipment operators, check blind spots. - SECOR ● Monitor air around trench/excavation in accordance with Section 12. - SECOR ● Have appropriate respirator with combination organic vapor/P-100 cartridges within 3-5 feet of working location, readily available. - SECOR
Supervisor/HSC must confirm all trenches/excavations are closed, filled in and/or capped.		Possible injuries and damage to property due to slope/sidewall failure and/or falling into excavation.	● Visually inspect each and every trench/excavation. - SECOR ● If trench/excavation is left open overnight, cover completely with trench-plate or completely surround the trench/excavation with delineators and snow fence. - SECOR
Clean site/demobilize	Steel toed and puncture resistant sole boots, hardhat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for the non-chemical aspects of work as needed.	Traffic. Safety hazard left on site. Lifting hazards.	● Use buddy system as necessary to remove traffic guidance and control equipment. - SECOR ● Leave site clean of refuse and debris. - SECOR ● Notify station personnel of departure. - SECOR ● Use proper lifting techniques or use mechanical assistance. - SECOR
Package and deliver samples to lab		Bottle breakage (if any), back strain.	● Handle and pack bottles carefully (bubble wrap bags are helpful). - SECOR ● Use proper lifting techniques. - SECOR

ATTACHMENT 1

CLIENT'S SAFETY PROCEDURES

Contractor/ Vendor Safety Handbook



July
2006

Hamilton Sundstrand

A United Technologies Company

Rockford, Illinois

Emergency Phone Numbers:

Medical Fire Chemical Spill	**6666**

Also Contact Your Project Coordinator:

Name_____ Phone_____

REPORT ALL EMERGENCIES IMMEDIATELY.

PURPOSE

This handbook is intended to be a guideline for all outside contractors and their employees who perform services on or in any of our Hamilton Sundstrand facilities. Examples of such services include but are not limited to construction trades, industrial cleaners, machine repair, equipment maintenance and service and engineering firms, consultants, laboratory, manufacturing or office services.

Hamilton Sundstrand requires that all applicable environmental, health and safety measures be followed by the contractor during all phases of work on all projects to ensure the safety of contractor personnel, Hamilton Sundstrand employees and property. The general contractor or contractor is responsible for its agents and subcontractor's actions in regards to compliance with all applicable laws and Hamilton Sundstrand procedures.

The rules and requirements outlined in this booklet should serve as a guide. These requirements are not all inclusive and there may be additional requirements that are specific to the site or tasks. The contractor, as a minimum, must comply with applicable Occupational, Safety and Health Act (OSHA) sections 1910 and 1926, National Fire Protection Association (NFPA), and Environmental Protection Agency (EPA) regulations.

If there are any questions about this guide, or any doubt concerning any environmental, health or safety issues contact your employer, your Hamilton Sundstrand Project Coordinator or a Hamilton Sundstrand EHS professional.

Copies of this guide are available from your project coordinator or the site Environment, Health & Safety Department.

HAMILTON SUNDSTRAND
ROCKFORD CAMPUS
ENVIRONMENTAL, HEALTH & SAFETY POLICY

Hamilton Sundstrand Rockford Campus is committed to being a leader in Environmental, Health & Safety (EH&S) by conducting it operations in a manner that protects the environment, health and safety of our employees, neighbors and community. EH&S shall be valued equally with quality, customer satisfaction, and cost. Safety and environmental considerations shall be a priority in new product development and investment decisions, and in our dealings with contractors and suppliers.

It is the responsibility of all employees to comply with company safety rules, to follow safe work practices and procedures established to protect the environment, and to report to his/her supervisor all unsafe acts, hazardous conditions, and conditions which impact or have the potential to impact the environment. It is the responsibility of the Rockford Campus leadership to maintain an EH&S management system that establishes both short and long term goals, establishes processes for controlling and monitoring that system, ensures the appropriate training of all employees, and provides communication to the entire campus on matters of EH&S.

Rockford Campus leadership is committed to the continual improvement of our EH&S performance and will authorize the action and financial resources to achieve these objectives. We are dedicated to keeping our workplace safe from hazards, our employees free from injury, our products and services safe, and our protection of the environment second to none.

Tim Morris

Tim Morris
Site Executive
Hamilton Sundstrand - Rockford Campus

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CONTRACTOR RESPONSIBILITIES

All contractors are responsible for the following:

1. Each contractor must complete an EHS pre-qualification questionnaire. This process will help Hamilton Sundstrand identify those contractors who have effective health and safety programs with demonstrated leadership and performance in their industry.
2. All contractors must communicate in English with the level of proficiency necessary to ensure the safety of their employees and the safety of affected Hamilton Sundstrand employees.
3. Obtain initial orientation to the Hamilton Sundstrand EHS guide for contractors by project coordinator or site EHS.
4. Comply with all the requirements of this guide.
5. Provide information and training to all employees including temporaries and subcontractors.
6. Ensure that subcontractors comply with the requirements of the project and this guide.
7. Contractor Activities and performance will be inspected, audited, and evaluated according to provisions outlined in Hamilton Sundstrand Contractor Safety Procedure # 37-508.
8. Immediately report all injuries/fires/chemical spills to the Hamilton Sundstrand project coordinator.

INSPECTIONS

The contractor shall perform weekly self-inspections to ensure compliance. Results of the inspections must be shared with Hamilton Sundstrand project coordinator.

INJURIES

1. Contractors are responsible for any injuries to their workers or Hamilton Sundstrand employees on their job site. This responsibility includes notifying proper medical personnel in case of an accident. Emergency numbers are found in the front of the booklet.
2. Contractors shall also notify the project coordinator of *ALL* accidents involving injury to personnel and damage to property regardless if any medical attention was required. Written reports of injuries must be submitted to the project coordinator within 24 hours.
3. Root cause accident/incident investigations completed and copies forwarded to Hamilton Sundstrand Project Coordinator and site EH&S.

CARDINAL RULES

"A rule that if violated may cause a fatal or serious injury to a person or harm to the environment."

1. Fall Protection

   Employees shall use fall protection when exposed to a fall hazard (working at an elevated level of two meters / six feet or more).

2. Machine Guarding

   Employees shall not knowingly tamper with or disable machine / equipment guarding while operating under normal conditions.

3. Hazardous Energy

   Prior to performing work on machines or equipment, employees shall identify all hazardous energy forms, bring them to a Zero Energy State* and secure them.

   This shall include but is not limited to mandatory use of lockout procedures when working on any electrical, mechanical, pneumatic, chemical or thermal processes.

   *Zero Energy State is defined as the elimination and/ or control of hazardous energy such that it no longer represents a hazard to employees working.

4. Electrical Safety

   Ground Fault Circuit Interrupters (GFCIs) must be used with all portable tools and portable electrical devices.

5. Confined Spaces

   Employees shall use proper safeguards and controls prior to working in confined spaces.

GENERAL SAFETY RULES

1. Report all accidents and injuries to your supervisor, foreman and/or Hamilton Sundstrand project coordinator at the time of their occurrence.

   Note: First Aid facilities and services are available during normal working hours.

2. "Horse play", throwing things, running, distracting employees at work, and unnecessary shouting is prohibited.

3. All spilled oil, grease, water and other liquids must be wiped up immediately and disposed of according to EHS procedures.

4. Areas in which overhead work is being performed shall be posted and isolated (barriers, tape, rope, cones, etc.) to prevent injury from falling objects. Hard hats and applicable fall protection measures must be used.

5. Obey posted safety or department rules when in these specific areas.

6. Each worker must wear clothing, footwear and protective eyewear appropriate for a particular task or work area.

7. Hamilton Sundstrand is a no smoking facility; Smoking is not permitted on Hamilton Sundstrand property; all employees, visitors, guests, temporary workers, vendors, contractors are expected to comply.

8. The use of head phones for the purpose of listening to "Walkman" radios, CD players or tape players, etc., is not permitted in shop areas.

9. All machinery and equipment must be operated with proper guards, shields, covers, etc. in place at all times.

SECURITY

1. All contractors, subcontractors and their employees shall conform to all Hamilton Sundstrand site security rules and requirements. Violations or disregard of these rules may be cause for denial of access.
2. Contractors must be pre-approved to access the facility.
3. All contractor personnel must clear a background check prior to assignment at any Hamilton Sundstrand facility.
4. Special permission must be obtained through site EHS for access to the facility on weekends and holidays.
5. All visitors, guests, temporary employees, vendors and contractors, are required to sign-in/out of all Hamilton Sundstrand facilities.
6. Appropriate badges must be visible at all times and worn at or above the waist at all times when in the facility.

   Visitor badges and Facilities Engineering Service Contractor badges, must be turned back in to the receptionist or security officer when signing out of the facility.
7. Personal vehicles must be parked in designated open parking areas. Vehicles parked in reserved, medical or handicapped parking spaces will be towed at the owner's expense.

   Contractor delivery vehicles must park in designated areas.
8. Due to insurance and liability issues, contractors and vendors are not allowed to use Hamilton Sundstrand's tools or equipment to conduct work at or in our facilities.

9. Camera and video equipment (including cell phones with digital camera capability) require a pre-approval and a pass from the Environment, Health and Safety department.
10. Contractor employees are restricted to the area in which they are assigned to work.
11. Contractors are responsible for the security of all materials, tools and equipment used for the job, including any rented tools or equipment.
12. All packages, equipment, tool boxes, trailers and vehicles are subject to searches and inspections by the Hamilton Sundstrand security officers.

HOUSEKEEPING

1. Good housekeeping is an essential part of our safety program. Keep work areas clean and as orderly as possible.
2. Oily rags, paint related materials, metal turnings and other similar hazardous materials must be placed in metal containers with self-closing lids.
3. Trash and litter shall not be allowed to accumulate. Floors and work surfaces must be kept clean. Debris must be swept or picked up and placed in waste containers on a daily basis.
4. Materials and equipment must be kept out of the aisles, passageways and doorways. Keep bases of ladders, steps and ramps clear.
5. Materials shall not be stored in stairwells.
6. Do not block fire exits, extinguishers, stretchers, alarms, alarm panels, electrical switch boxes, emergency equipment, etc. with materials or machinery.
7. Clean up immediately any oil, grease, fluids, water or other slippery substances that are spilled on the floor or work surface and dispose of in accordance with facility EHS procedures.
8. Do not spit tobacco, throw wrappers, shells, etc. on the floor. Put in proper waste containers.
9. No material shall be stored outdoors without the permission of the project coordinator or the EHS department.
10. Lumber shall be neatly stacked when not in use and all nails shall be removed or bent over to prevent puncture wounds.

EMERGENCIES

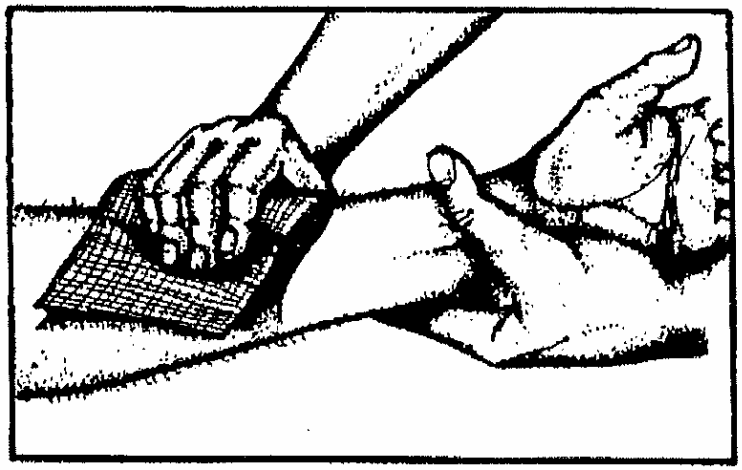
1. **Medical Emergencies**

   a. Do not attempt to move an injured person; wait until properly trained medical assistance arrives. Be sure you know how and where to call for help.

   b. Report all medical emergencies immediately. Know and call the medical number for your facility and give the location of the emergency (6666).

   c. If working with corrosive materials (acids, caustics and solvents), know the location of the nearest eyewash, sink, safety shower, etc., in the area.

   Flush contaminated area for 15 minutes and get medical attention, if necessary.



Control bleeding by pushing directly on the wound.

2. **Fire Emergencies**

   a. Report all fires immediately. Call facility emergency number (6666). Give location of the fire. Stay on the telephone until released by the answering party.

   b. Know the location of the nearest fire extinguisher. Do not attempt to discharge a fire extinguisher unless you are familiar with its proper use.

   c. Take steps to prevent fires by properly storing, handling and using flammable or combustible materials.

   d. Obtain hot work permits prior to welding, cutting, brazing or soldering.

   e. Follow good housekeeping rules.

3. **Chemical Emergencies (Spills)**

   a. Report large spills immediately by calling the facility emergency phone number (6666). Provide the answering party information on the material spilled, quantity spilled, location of the spill, etc. Do not hang up until the answering party releases you.

   b. Get away from the area, isolate the area, keep others away until emergency response teams arrive on the scene.

   c. Small spills must be cleaned up immediately. Waste materials must be discarded according to the Hamilton Sundstrand Facility Environmental Coordinator.

4. **Severe Weather**

   a. Each affected facility has designated "severe weather" shelter areas.

   b. In the event of a severe weather warning, site personnel will be alerted to take cover.

   c. Turn off equipment and buddy up with a Hamilton Sundstrand employee and proceed to a designated shelter area.

5. **Facility Evacuation**

   a. If the facility must be evacuated, personnel will be notified to evacuate. You should buddy up with a Hamilton Sundstrand employee and proceed to the nearest exit.

   b. Project coordinators will designate an assembly area outside of the facility.

   c. Site/project supervisor must take a head count and report to site emergency evacuation coordinator.

HAZARDOUS MATERIALS

1. Chemicals brought onto Hamilton Sundstrand property must receive prior approval from the Environment, Health and Safety Department. Material Safety Data Sheets must be provided on request.

2. Material Safety Data Sheets for hazardous materials used by Hamilton Sundstrand can be provided by the project coordinator or by contacting the Environment, Health and Safety Department.

3. Prior to your use of hazardous materials, or contact with any hazardous materials used at Hamilton Sundstrand facilities, you should receive a briefing from your supervisor or a Hamilton Sundstrand representative. If you do not receive this information, please contact your Hamilton Sundstrand representative or the Environment, Health and Safety Department.

4. All containers of hazardous materials must be legibly labeled, tagged or marked with the identity of the material and appropriate hazard warnings.

   Unlabeled containers must be relabeled or taken off the premises.

   Labels must not be removed, defaced or obscured.

   Hamilton Sundstrand uses the NFPA 704M and the HMIS labelling systems to identify storage areas and containers of hazardous materials.

   If you are not familiar with these systems please contact the Environment, Health and Safety Department.

5. Chemicals must be stored in closed containers. Secondary containment must be provided for containers of chemicals which hold more than one shift's supply of material. Flammable solvents, paints, fuels, etc. must be stored in Factory Mutual (FM) approved safety cans.

6. All unused chemicals and materials must be removed from the site at the completion of the project.

7. Wiping cloths contaminated with combustible and flammable solvents must be placed in FM approved containers with self closing lids.

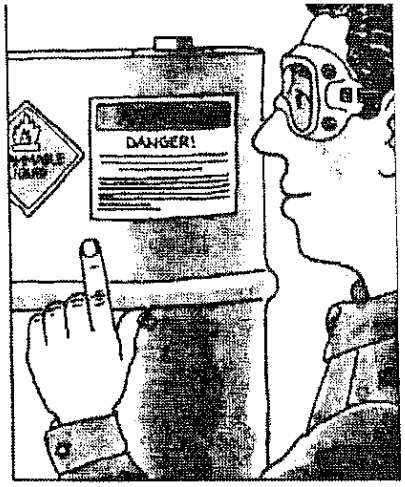
8. All paint, varnish and brush cleaner cans must be kept closed when not in use.

9. Safety is important, protective equipment must be used as required.

10. Know what you are doing! When handling or being exposed to any chemical with which you are unfamiliar, contact your supervisor and refer to proper safety procedures.

11. Under no circumstances will any hazardous chemical be allowed to be dumped down a drain or spilled into any storm sewer.

12. If a large chemical spill should occur, secure the area, stop the source of the spill. If it can be done safely, isolate the area and initiate emergency response by calling the facilities emergency phone system (6666).



Always read the label before you begin a job using a potentially hazardous chemical.

MATERIAL HANDLING

1. Materials, tools, and equipment must be moved in and out of the facility through designated controlled points only. Materials are subject to a security challenge.
2. Contractors are responsible for shutting off vehicles and chocking rear wheels at loading docks if necessary. (Some docks may have dock locking devices.)
3. Vehicles shall be maintained in proper running order.
4. Vehicles or equipment with internal combustion engines must be pre-approved by project coordinator.
5. Operators must be trained and have valid permits for vehicle being operated.
6. Aisles shall not be used for storage or staging equipment or materials.

PERSONAL PROTECTIVE EQUIPMENT

1. All personnel must wear, as a minimum, safety glasses with side shields, in any shop area or when performing maintenance or construction work related activities anywhere in the facility. Photogray or sunglasses are not allowed in shop areas.
2. Safety hard hats shall be worn whenever work is being performed overhead, on elevated platforms or in any other posted area.
3. Hearing protection shall be worn in posted areas of the facility, and as required based on the type of work performed.
4. Safety shoes are required when working in any shop area or when performing maintenance or construction related work. Shoes constructed of materials other than leather or synthetic leather (canvas, nylon, etc.) are not permitted in any shop area. The non-leather constructed shoes mentioned above, or shoes with exposed toes, heels or arches, or footwear with heels greater than 1-1/2" (inside measurement) are restricted to the main aisles only.
5. Additional protective equipment such as, gloves, aprons, goggles, face shields, etc., may be required based on the type of work performed.

LOCKOUT/TAGOUT - ENERGY CONTROL

1. Hamilton Sundstrand has a lockout/tagout procedure which requires compliance by all affected employees.

2. If any outsider is required to work on equipment which must be de-energized using energy control devices (locks), they must follow the energy control procedures established for that equipment.

3. Affected contractors and vendors lockout/tagout programs must be reviewed by the Environment, Health and Safety Department or site safety coordinator for adequacy prior to the start of the work.

   If the program does not meet current OSHA standards, the contractor or vendor must follow Hamilton Sundstrand facilities lockout/tagout program.

   Proof of training must be made available upon request.

4. Persons applying energy control devices must notify any Hamilton Sundstrand operators and area Hamilton Sundstrand supervisors and contractor supervisors or employees of their intent to shut down a piece of machinery or process.

5. After de-energization and before any work is performed, the individual(s) must verify that all energy sources have been de-energized.

6. Before equipment or processes are started back up, the area and equipment shall be inspected to make sure all tools, equipment, parts, debris, etc., are cleaned up, guards replaced and Hamilton Sundstrand equipment operators and area Hamilton Sundstrand supervisors and contractor supervisors or employees are notified of the intent to start up equipment.

CONFINED SPACE WORK

1. All work conducted in confined spaces must have a permit to authorize entry.

2. All affected contractors or vendors required to work in confined spaces must have a confined space entry program.

   This program must be presented to the Facility Environment, Health and Safety Department for review prior to the start of any scheduled work activity. The contractor or vendors' confined space entry program must meet minimum requirements of the OSHA confined space entry standard, including provisions for rescue in the event of an emergency.

   Proof of training must be made available upon request.

3. Contractors or vendors without adequate confined space entry programs will not be allowed to perform any work in confined spaces.

HOT WORK (Welding, Cutting, Brazing, etc.)

1. Any hot work conducted outside of a designated welding, cutting, or brazing area, must have a permit authorizing the work. A signed written permit must be obtained from the Environment, Health and Safety Department or its authorized representative. (Maintenance Supervisor, or Facility Engineer)

   Hot work permits can be issued for a maximum of one shift.

2. If hot work must be performed outside of a designated hot work area, the contractor welder, welder's supervisor or Hamilton Sundstrand facility contact, must first notify the area or department supervisor of the intent to perform any type of hot work.

3. A fire watch must be assigned to the job. The fire watch must know how to use the proper fire extinguishers and access the Hamilton Sundstrand emergency system. The fire watch must stay at the job for at least 60 minutes after hot work is completed.

4. Fire protection sprinklers must be in service in any area where hot work is being performed.

5. Welding points of operation shall be blocked from view of passers-by with barriers, impenetrable welding screens, etc.

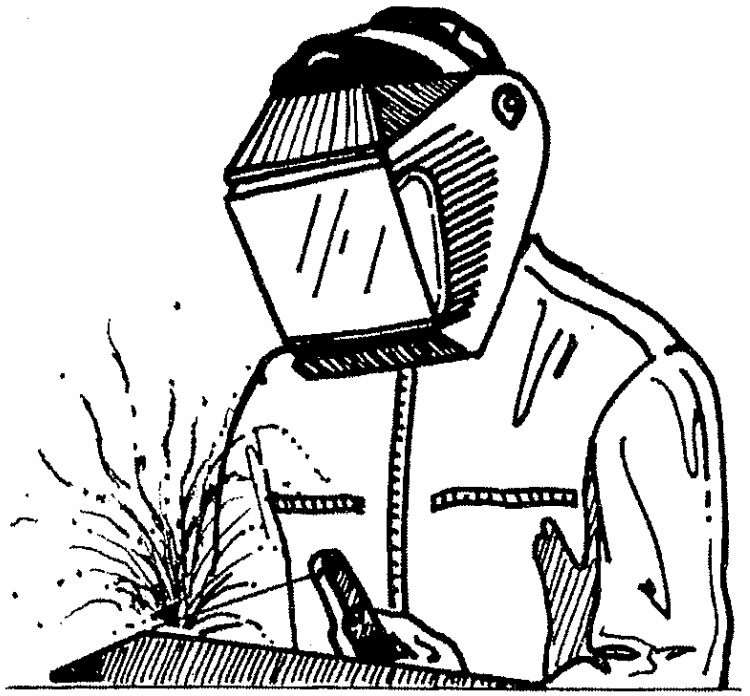
6. Before starting, sweep floors clean, wet down wooden floors, or cover them with sheet metal or spark resistant welding tarps or equivalent. Cover open holes and floor grating with sheet metal or welding tarps. Do not allow sparks to enter doors, windows or ventilation systems.

7. Move combustible materials 35 feet away; cover any material, which can not be moved, with fire retardant welding tarps carefully and completely.

8. Copies of the hot work permit must be sent back to the Environment, Health and Safety Department when work is complete.

9. Welding on structural steel must be approved by facility engineering.

10. Any hot work conducted in any of the test labs must be pre-approved by the Environmental Health and Safety Department.



ELECTRICAL SAFETY

1. Only qualified persons may work on electrical circuits, parts, equipment, etc. Do not touch any electrical equipment unless okayed by your facility contact.

2. Extension cords must be rated for the load they will carry. Inspect cords for signs of wear or damage; do not use cords if grounding prong is missing.

   Cords must be protected from damage and secured to the floor to prevent a tripping hazard. Do not drape cords over conductive materials, through doorways or across aisles or walkways.

3. Special processes and environments will put additional restrictions on the use of temporary wiring and extension cords.

   Specific examples include test cells, construction sites and wet locations.

4. GFCI protectors are to be used on all portable equipment powered by extension cords at construction sites.

5. Space heaters, coffee pots, and portable power tools must be in good repair and have UL listings.

6. Safe work practices outlined in OSHA 1910.331 – 1910.335 shall be used to prevent injury when working near electrical equipment or wiring.

COMPRESSED GAS

1. When transporting compressed gas cylinders, they must be secured and fastened in an upright position. Cylinder valves shall be closed tightly when not in use and safety caps must be in place.

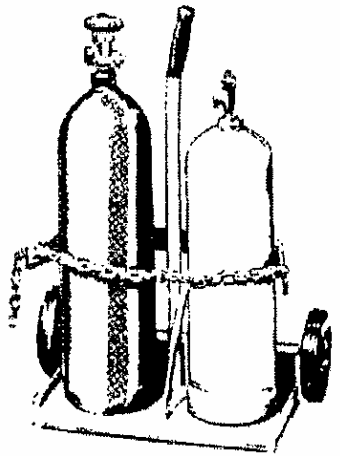
2. Cylinders must always be stored, chained, strapped or secured in an upright position away from heavy traffic to prevent accidental tipping.

3. All cylinders must be labeled as to their contents.

4. Oxidizing gases (oxygen) must be stored 20 feet from flammable liquids (gasoline) or gases (actylene), or separated by a 1/2 hour fire-rated barrier.

5. Acetylene cylinders shall not be transported or stored on their side.

6. Cylinder carts must be used to transport compressed gas cylinders.



COMPRESSED AIR

1. Compressed air shall not be used to clean floors, equipment or an individual's clothing or body.

2. Maximum operating pressure (at nozzle) is limited to 30 psi when compressed air is used for part cleaning.

HAND TOOLS

1. Hand and power tools shall be kept in good repair. Tools shall be used for their intended purpose.
2. Tools and other materials shall not be left on working surfaces, ladders, scaffolding or other places they could cause someone to trip or be dislodged and fall.
3. Electrical power tools shall be double insulated or electrically grounded using three conductor cord and three pronged plugs.
4. Ground fault circuit interrupters (GFCIs) are required for use with all portable hand tools and extension cords.
5. All tools and equipment must be supplied by the contractor. Hamilton Sundstrand tools and equipment shall not be used.

LADDERS AND SCAFFOLDS

1. Ladders must be free of defects and in good working order. Ladders that are defective shall be removed from the site.
2. Ladders must be secured to keep from shifting or being knocked down or blown over by wind. Ladders must be taken down and secured at the end of the work day.
3. Ladders shall not be placed in front of doors or wall openings unless the door is blocked open, locked or guarded by a responsible person.
4. If ladders are used in aisles or high traffic areas, safety cones must be placed on each side of ladder.
5. The top and first rung below the top of a step ladder shall not be used to stand on.

6. Portable metal or conductive ladders shall not be used near energized electrical lines or equipment.
7. Ladders must only be used for the purpose for which they are designed.
8. Scaffolds and their components must meet accepted requirements outlined in OSHA 1910 and 1926 standards.
9. Platforms and planks shall be cleated to the scaffold to prevent platform slippage.
10. Platforms shall be at least two planks wide (20") and extend over the supporting surfaces or edges not less than 6" or more than 12 inches.

EXCAVATIONS

1. Any excavation work must be preapproved by the site Environment, Health and Safety Department. These activities include, but are not limited to disturbing any soil, asphalt, concrete or surface inside or outside the facility.
2. All fill must be "certified" as clean. The contractor must provide a written letter to the project coordinator. The project coordinator must obtain approvals prior to use of the fill materials.
3. The location of all underground utilities must be predetermined and marked.
4. Erosion control practices must be implemented to prevent storm water run off.
5. Appropriate sloping and shoring techniques must be applied if excavations are more than 5 feet deep.
6. Daily inspections shall be made by the contractor to determine condition of the excavation.

BARRICADES

1. Snow fencing, partitions, expandable gates a minimum of 42" high are required for new construction or unattended work areas.
2. Caution or danger tape must be used for work in progress that is continuously supervised that has hazards that has a potential for causing injury.
3. If aisles require blocking, prior approval must be obtained from the Hamilton Sundstrand EHS Department.
4. All construction areas must be marked or barricaded and appropriate construction signs posted to keep out all unauthorized personnel.
5. All trenches, holes and pits must be barricaded.
   - > 4 feet deep – standard rail system that meets OSHA 1910.23 (e) requirements 4 feet from the edge of the opening.
   - < 4 feet but > 1 foot – 42" high fencing, expandable gates or equivalent 4 feet from edge of the opening.
   - < 1 foot deep and unattended (work not in progress) caution tape 4 feet from edge of the opening.
6. Wall openings, from which there is a drop of more than 4 feet shall be guarded with a standard railing and mid-rail. A toe board shall be installed if a person can pass beneath the opening.
7. Alternate methods may be used if authorized by the EHS department.

OVERHEAD WORK

1. Safety stanchions, barriers or cones must be used to protect workers on ladders or lifts, particularly when working above suspended ceilings, near aisles or doorways.
2. Contractor personnel performing work above floor level must wear ANSI approved head protection. Contractor personnel working in areas below overhead work areas must also wear appropriate head protection.
3. When scissor lifts are used, an area of at least 3 feet in all directions from the lift must be marked off with stanchions, barriers or cones.
4. All employees using an aerial lift shall be properly trained for the lift in use.
5. Employees shall work from the floor of the lift only. Approved anchor points, for body harness and lanyards must be used if the employee has to climb on the hand rail, mid-rail or out of the lift.
6. Personal fall protection must be used when using telescoping or articulating boom lifts, and other aerial lifts without appropriate handrails.
7. Contractors requiring roof access must notify and obtain approval prior to accessing any roof from their Hamilton Sundstrand project coordinator.
8. The "buddy system" must be employed at all times when work is performed on any roof. Exceptions may be made by project coordinator or site Environment, Health and Safety if appropriate communication measures have been demonstrated.

ENGINES

1. Gasoline, LP gas or other internal combustion engines must not be operated inside buildings or on roof tops without prior approval from the Hamilton Sundstrand project coordinator.
2. A written authorization must be obtained from site Environment, Health and Safety. Appropriate fire extinguishers must be available. Gasoline or other flammables must be contained in FM approved safety cans.

POWERED INDUSTRIAL VEHICLES

1. Contractor personnel shall have valid operator license for vehicle being operated.
2. Contractor shall obey all applicable traffic regulations and posted limits while on Hamilton Sundstrand property.
3. Parking is limited to designated areas.
4. When loading or unloading trucks or trailers; vehicle engine must be turned off; rear wheels must be chocked if vehicle is not compatible with facility dock locking and leveler system(s).
5. Contractors are not allowed to use any of Hamilton Sundstrand powered industrial vehicles.
6. Contractors shall keep powered industrial vehicles in good repair and operate them as designed.

FALL PROTECTION

1. Any employee working 6 feet or more above an exposed work surface must use fall protective equipment.
2. Fall protection systems consist of an approved full body harness and a shock-absorbing lanyard.

   Note: If work requires the employee to move about from one anchorage point to another, two lanyards are required. (The second lanyard is attached to an anchorage point prior to the disconnection from the original anchor point.)
3. Anchor points must be at waist level or higher; capable of supporting a minimum of 5,000 lbs. per employee attached.
4. All equipment must be inspected by the user prior to use.
5. All employees who are required to perform elevated work must be fully trained in elevated work practices including, the care and use of safety equipment.

STACKS AND DRAINS

1. Exhaust systems, stacks, and drains shall not be installed, modified, or moved in any way without prior approval from the EHS department.

WASTE MANAGEMENT

1. Any process that generates a waste, discharged water, or air emissions must have pre-approval from the site EHS department.
2. Waste materials shall be categorized and placed in appropriate labelled containers.
3. No waste material shall be transported or disposed of off site without the approval of the EHS department.
4. Contractors shall provide for or coordinate trash and debris removal with the project coordinator. Examples of general trash include:
   a. Uncontaminated packing
   b. Uncontaminated machinery components
   c. General household waste
   d. Landscape waste
   e. Construction debris or demolition debris
   f. Food, food related
   g. Wipes from hand washing
5. All waste generated on location shall be disposed of as approved by the EHS department.
6. Wastes (including rinse and wash water) are not to be poured into sinks, drains, toilets, storm sewers or on the ground.
7. Regulated wastes are not to be disposed of in dumpsters or compactors. Examples of regulated materials include:
   a. Cutting oil
   b. Paint related material
   c. Solvents, paints, other fluid
   d. Retail products (ie. glues, adhesives)
   e. Contaminated materials w/oils, solvents, and paints

8. Container, including roll-off boxes shall be covered at all times to keep out precipitation.
9. Hamilton Sundstrand EHS personnel shall manage the containerization, removal, transportation of all regulated wastes, materials, and chemicals.

OFFICE SAFETY

1. Keep file cabinet and desk drawers closed after use or if left unattended. Top drawers left open can injure your head; bottom drawers left open can create a tripping hazard.
2. Never overload top file drawers or open more than one drawer at a time....the cabinet may tip over.
3. Never place electric cords, extension cords, wires, computer cables, etc., across walkways, aisles, landings or stairs. This can create a tripping hazard or contribute to a fire or shock hazard.
4. Do not stand on or lean too far back on chairs. Use caution with chairs on casters. Be sure you are directly over the chair before sitting down.
5. Walk, never run, in halls and on stairways. Use handrails and watch your step. Use caution when rounding any blind corners or approaching hall crossways and aisle intersections. Be careful when opening or closing doors to avoid striking someone on the other side.
6. Be cognizant of the requirements for and diligence in the use of personal protective equipment when entering areas where required. (Safety glasses with side shields and leather type shoes are required in all shop areas.)

THINK SAFETY!

In The Office

Guidelines for Contractor EH&S Violations

Violation	Disciplinary	Action
Non Serious	1st Violation	Deficiency noted on inspection form; verbal warning to contractor lead person; copy of inspection form to contractor.
	2nd Violation	Letter sent to Contractor from Project Coordinator
	3rd Violation	Letter sent to contractor from responsible Purchasing contact; contractor required meeting with site representative to discuss improvement plan and implementation.
	4th Violation	Contractor banned from site until EH&S program deficiencies are corrected.
Serious	1st Violation	Individual Contractor employee(s) banned from HS site; letter to Contractor outlining violation and requiring a written response from contractor describing corrective action.
	2nd Violation	Contractor banned for one year. Reinstatement only after demonstrating significant improvement in EH&S program.
	3rd Violation	Contractor permanently banned

1. Violations are recorded over a rolling twelve (12) month period.
2. Contractor will be required to pay for all costs associated with spill cleanup.
3. Serious injury: Any job-related incident which results in hospital treatment or admission of three or more employees; or any job-related incident which results in prolonged loss of consciousness; paralysis; fractures to multiple limbs, the head or back; multiple fractures of the same limb; an injury that results in cardiac or pulmonary arrest; an injury that results in a loss of a major body part or function; or any serious near miss that could have resulted in loss of life.

All possible situations cannot be covered in this or any other safety publication. Therefore, any time you are not sure of the safe method or procedure to be followed in any situation, immediately contact your management, team leader, your Hamilton Sundstrand project coordinator, or the Environment, Health and Safety office for instruction. List below any safety precautions specific to your job.

NOTES

NOTES

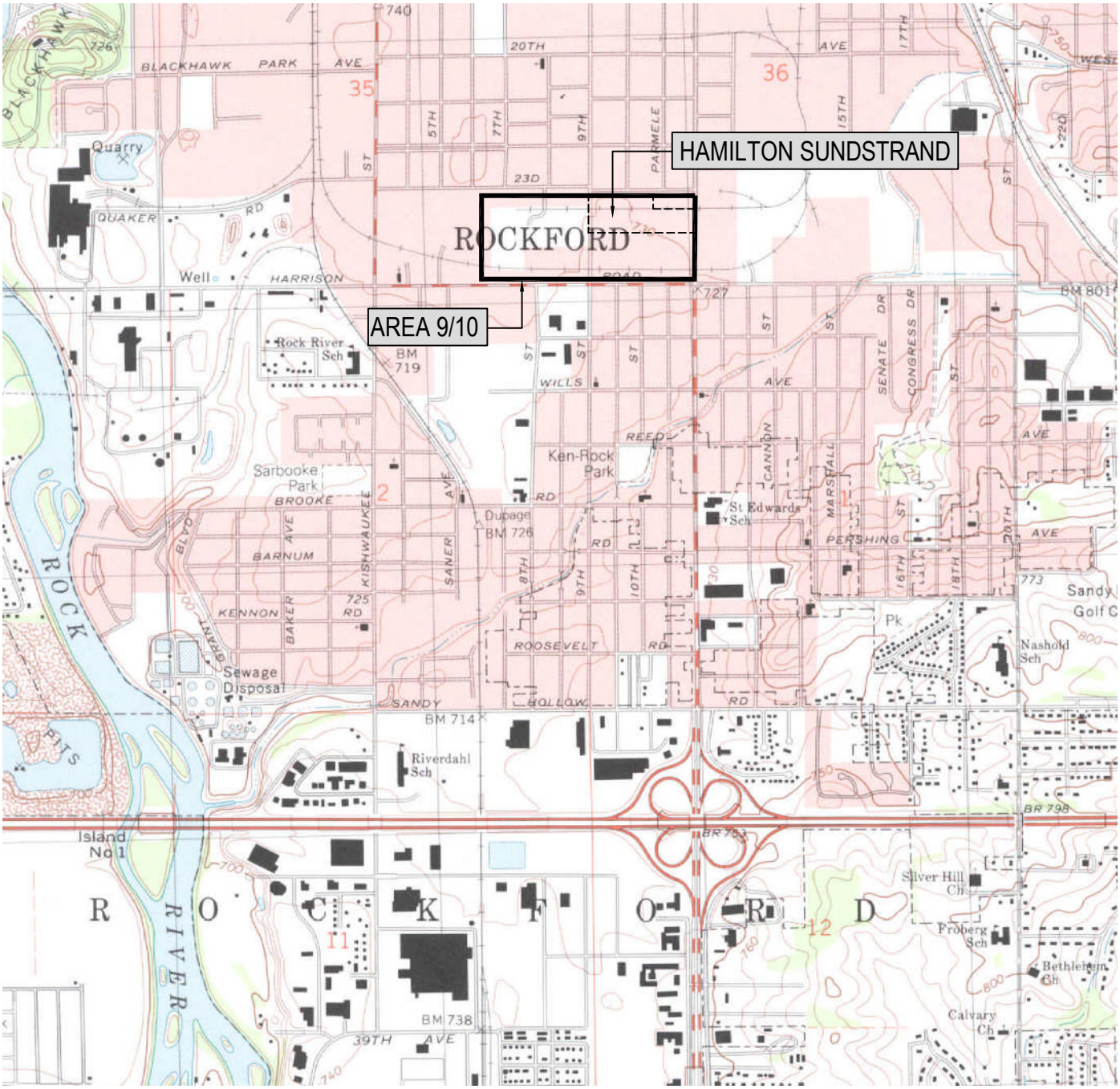
NOTES

SAFETY: EVERYONES RESPONSIBILITY

REPORT UNSAFE CONDITIONS PROMPTLY

ATTACHMENT 2

SITE PLAN(s)



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1 1/2 0 1

SCALE IN MILE

1000 0 1000 2000 3000 4000 5000 6000 7000

SCALE IN FEET

REFERENCE: USGS 7.5 MINUTE QUADRANGLE; ROCKFORD SOUTH

SECOR
446 EISENHOWER LANE NORTH
LOMBARD, ILLINOIS 60148
PHONE: (630) 792-1680 FAX: (630) 792-1691

FOR:		FIGURE
HAMILTON SUNDSTRAND ROCKFORD, ILLINOIS	AREA 9/10 AND SITE LOCATION MAP	1.1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
13UN.02072.05.0001	GH/JC	KW		8/17/06

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LEGEND:

— — — PROPERTY BOUNDARY

0 120 240

APPROXIMATE SCALE (FEET)

N

SECOR
446 EISENHOWER LANE NORTH
LOMBARD, ILLINOIS 60148
PHONE:(630) 792-1680 FAX:(630) 792-1691

FOR:				FIGURE
HAMILTON SUNDSTRAND ROCKFORD, ILLINOIS		SITE MAP HAMILTON SUNDSTRAND PLANT #1		1.2
JOB NUMBER: 13UN.02072.06.0001	DRAWN BY: GH	CHECKED BY: KW	APPROVED BY:	DATE: 1-12-06

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LEGEND:

- MONITORING WELL
- RECOVERY WELL
- SOIL BORING
- PROPERTY BOUNDARY

NOTES:

1) WATER TABLE WELL SCREENS 30-45 FT BGS
2) MIDLEVEL WELL SCREENS 80-100 FT BGS (***SMW-9, SMW-11R, AND SMW-13***)
3) DEEP WELL SCREENS 120-140 FT BGS (***SMW-10, SMW-12, AND SMW-14***)
4) SCREEN INTERVAL DEPTHS ARE APPROXIMATE

0 120 240

APPROXIMATE SCALE (FEET)

N

BASE MAP DATA SOURCE: WinGIS - APRIL 27, 2001

SECOR
446 EISENHOWER LANE NORTH
LOMBARD, ILLINOIS 60148
PHONE: (630) 792-1680 FAX:(630) 792-1691

FOR: HAMILTON SUNDSTRAND ROCKFORD, ILLINOIS

SOIL BORING AND MONITORING WELL LOCATIONS

FIGURE 1.3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
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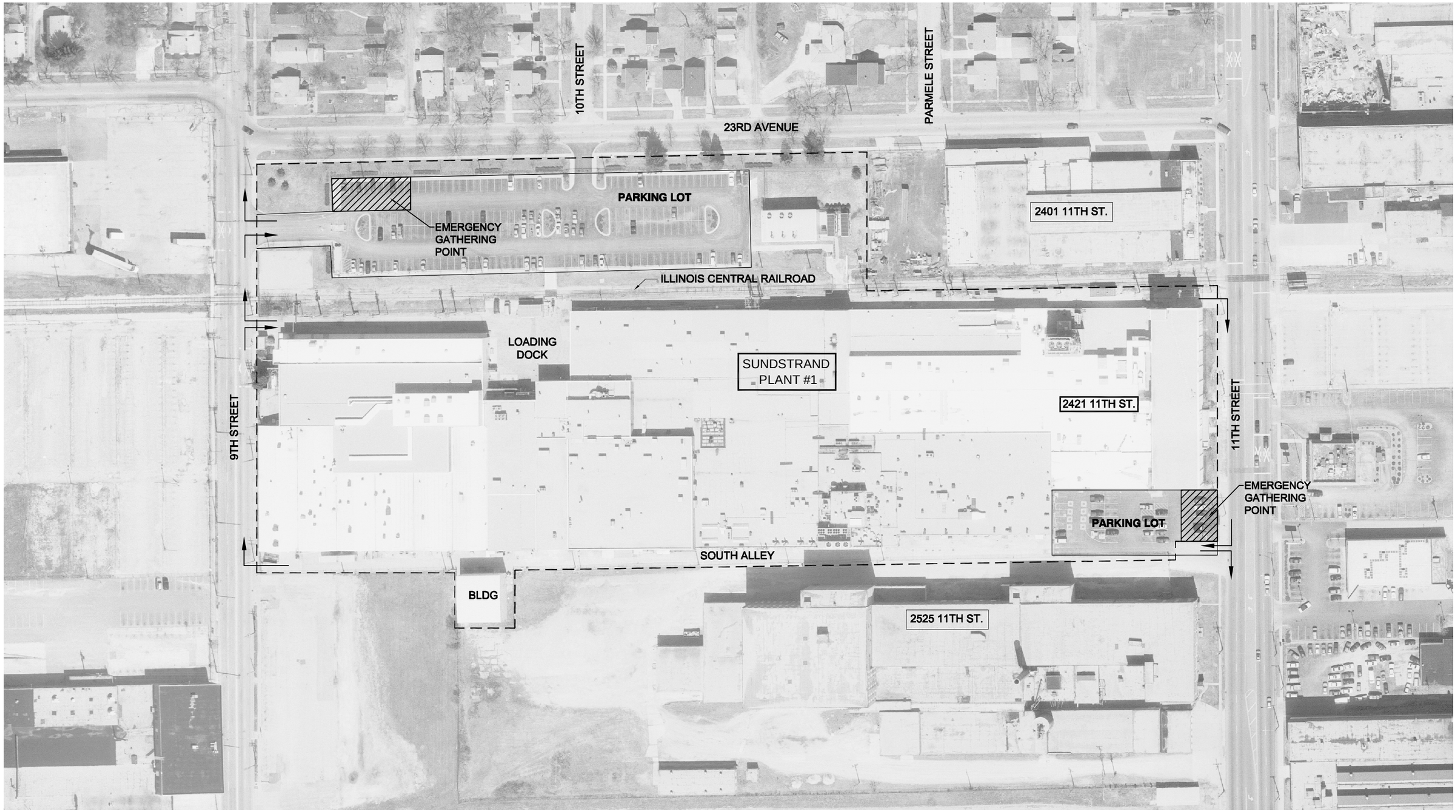


LEGEND:

— — — PROPERTY BOUNDARY

0 120 240

APPROXIMATE SCALE (FEET)

N

SECOR
446 EISENHOWER LANE NORTH
LOMBARD, ILLINOIS 60148
PHONE:(630) 792-1680 FAX:(630) 792-1691

FOR: HAMILTON SUNDSTRAND ROCKFORD, ILLINOIS

SITE ACCESS, EGRESS ROUTES AND EMERGENCY GATHERING POINTS
HAMILTON SUNDSTRAND PLANT #1

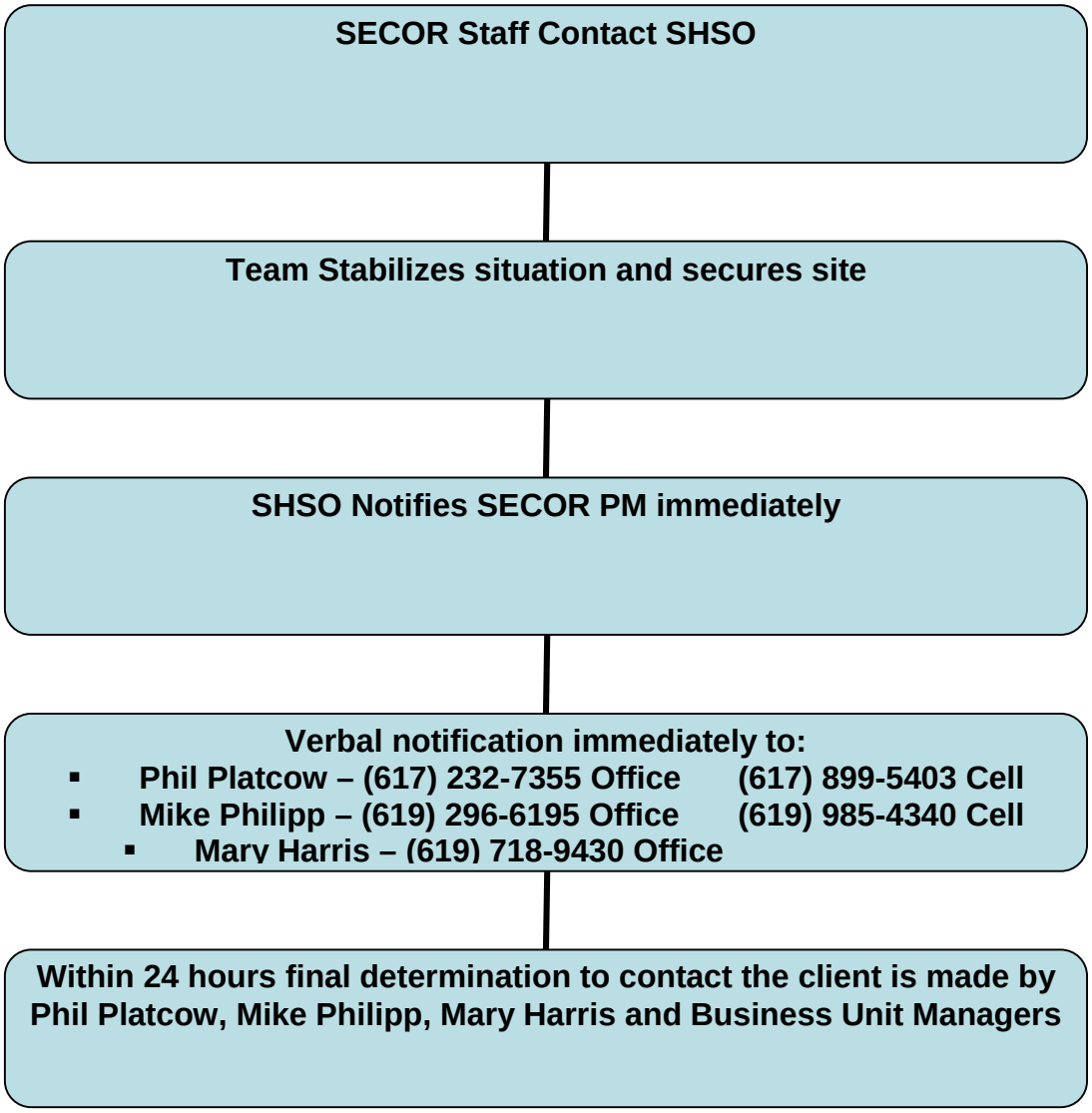
FIGURE 1.4

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
13UN.02072.06.0001	GH/JC	CA		1/05/07

ATTACHMENT 3
INCIDENT REPORTING PROCEDURES

ATTACHMENT 3a

INCIDENT INVESTIGATION REPORTING GUIDELINES
(MEDICAL EMERGENCY, FIRST AID, MVC, SPILL, NOV)



Incident Investigation / Near-Miss Investigation Report

Consider using the Root Cause Analysis PROACTIVELY to avoid incidents and near misses.

INCIDENT TYPE (To be filled in by Human Resources Department)			**Date of Incident:**
☐ Fatality	☐ Industrial Non-Recordable	☐ Spill/Leak	☐ General Liability
☐ Lost Workday	☐ Non-Industrial	☐ Product Integrity	☐ Criminal Activity
☐ LW Restricted Duty	☐ Off-the-Job Injury	☐ Equipment	☐ Notice of Violation
☐ OSHA Medical or Illness w/o LW	☐ MVA	☐ Business Interruption	☐ Near Miss
☐ First Aid	☐ Fire		

The SECOR Project Manager, Human Resources and Corporate Health & Safety must be informed immediately after stabilizing the victim(s)/site as the result of an incident or near miss. The investigation of the incident or near miss by the employee's supervisor or Site Health and Safety Officer must also begin immediately. This report must be completed as soon as possible, in most cases within the week of the incident. It must be reviewed and signed by the Principal and e-mailed or faxed to the Vice President of Human Resources, and Corporate Health and Safety (numbers at end), even if employee is not available to review and sign. Employee or employee's doctor must submit a copy of the doctor's report to Human Resources within 24 hours of the initial exam and any subsequent exams. Contact information at end of report.

EMPLOYER (Include sub-contractors, or other employers on our sites)

Company Name:					
Work Location Address where incident occurred:			Project Name:		

EMPLOYEE

Name:	
Employment Status: ☐Full-Time ☐Part-Time ☐Hourly-As-Needed	How long in present job?

INJURY OR ILLNESS INFO

Where did incident / near miss occur? (number, street, city, state, zip):	
County:	On Employer's premises? ☐Yes ☐ No
Specific activity the employee was engaged in when the incident / near miss occurred:	
All equipment, materials, or chemicals the employee was using when the incident / near miss occurred (e.g., the machine employee struck against or which struck employee; the vapor inhaled or material swallowed; what the employee was lifting, pulling, etc.):	
Describe the specific injury or illness (e.g., cut, strain, fracture, skin rash, etc.):	
Body part(s) affected (e.g., back, left wrist, right eye, etc.):	
Name and address of Health Care Provider (e.g., physician or clinic):	Phone No.:
If hospitalized, name and address of hospital:	Phone No.:
Date of injury or onset of illness(MM/DD/YYYY) / /	Time of event or exposure: ☐AM ☐ PM
Time employee began work: ☐ AM ☐ PM	Did employee lose at least one full shift's work? ☐ No ☐ Yes, 1st date absent (MM/DD/YYYY) / /
Has employee returned to work? ☐ Regular work ☐ Restricted work ☐ No, still off work ☐ Yes, date returned (MM/DD/YYYY) / /	
Did employee die? ☐ No ☐ Yes, date (MM/DD/YYYY) / /	
Date employer notified of incident / near miss: (MM/DD/YYYY) / /	
To whom reported:	
Other workers injured/made ill in this event? ☐ Yes ☐ No	

Description of Incident / Near Miss: (Describe fully the incident / near miss events. Tell exactly what happened and how it happened so that someone could recreate the incident or near miss. Use extra paper if you need.)
Weather (Fog, rain, ice, sunshine, windy, extreme temperatures – report in degrees F or C)

Motor Vehicle Accident (MVA) - You may also have to fill out an insurance form-Call Corporate Contracts Dept. (425) 372-1600			Professional Driver? ☐Yes ☐No
Total Years Driving:	Company Vehicle? ☐ Yes ☐ No	Operation Type:	Accident Situation:
Truck Transportation:	Years with Carrier:	Vehicle Type:	Equipment #:
Accident Location (street, city, state):			
Hazardous Material? ☐ Yes ☐ No	Reportable? ☐ Yes ☐ No	No. of Vehicles Towed	No. of Injuries: / No. of Fatalities:

Spill/Leak/Product Quality

Product Name		Quantity		Product 2 Name		Quantity		Product 3 Name		Quantity	

Agency Notifications	
Estimated Cost of Incident	$

Third Party Incidents

Name of Owner		Address		Telephone	
Description of Damage:					
Witness Name		Address		Telephone	
Witness Name		Address		Telephone	

 # Root Cause and Contributing Factors: Conclusion (Describe in Detail Why Incident / Near Miss Occurred)

1	
2	
3	

Root Cause(s) Analysis (RCA) - Use proactively to avoid Incidents and Near Misses.

1) Deficiency in task related ability or knowledge
2) Deficiency in Standard Operating Procedures or Job Safety Analysis
3) Deficiency in the transference of information concerning the Standard Operating Procedures or JSA steps.
4) Deficiency or lack of the proper tools or equipment
5) Proper execution requires increased time or effort.
6) Improper procedures and performance is accepted and allowed.
7) Previous improper performance of a task did not result in adverse results.
8) Beyond the control of the Supervisor/worker(s).

#	RCA #	Solution(s): How to Prevent Incident / Near Miss From Reoccurring	Person Responsible	Due Date	Closure Date

Investigation Team Members

Name	Job Title	Date

Results of Solution Verification and Validation - after implementing solutions to make sure they work.

Reviewed By

Name	Job Title	Date

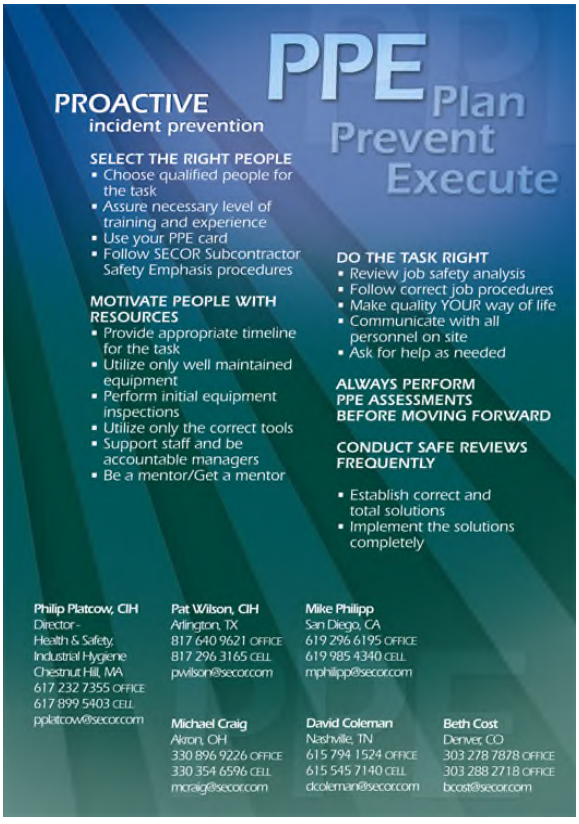
Acknowledgment Signatures for Injuries/Illnesses		
Title	**Signature**	**Date**
Director of HR: Marguerite Shuffelton		
Director of IH/H&S: Philip Platcow		
NAM:		
Regional Managers:		
Frank Aceto		
Oren Gottlieb		
Jim Grasty		
Russ Hamblin		
Sr. Vice President: David Childs		
Chief Executive Officer: Jim Vais		

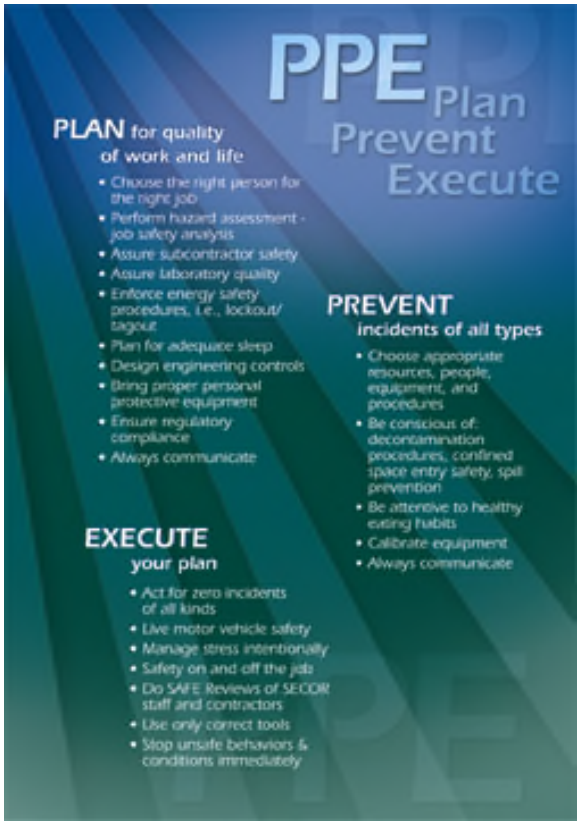
Contact information.
Call Human Resources and Corporate H&S Immediately.

HR: Mary Harris Phone: 619-718-9429, Fax: 619-296-2006, E-Mail: mharris@secor.com. After hours or weekends, please call Marguerite Shuffelton Cell: 619-925-8365 or Home 760-749-9603.

Health & Safety: Call Philip Platcow and Michael Philipp
Philip Platcow: 617-232-7355; fax 801-340-8657 Email: pplatcow@secor.com.
After hours or weekends, cell: 617-899-5403 or Home 617-739-1224 and
Mike Philipp 619-296-6195; fax 619-296-6199 Email: mphilipp@secor.com. After hours or weekends, cell: (619) 985-4340

Fax report to all three.





ATTACHMENT 3c
EMERGENCY RESPONSE INFORMATION

Local emergency contact information

	NAME	TELEPHONE
Hospital	**Swedish American Hospital 1401 East State Street Rockford, IL 61104**	**(815) 962-2679**
Ambulance	**Lifeline Ambulance Service**	**911 OR, (815) 877-4177**
Police	**Rockford Police Department**	**911 OR, (815) 987-5800**
Fire Department	**Rockford Fire Department**	**911 OR, (815) 987-5800**
Poison	**National Poison Control Center**	**(800) 876-4766**

DIRECTIONS

1. Start out going north on **11th Street** toward **23rd Street** **(1.5 miles)**
2. Turn left on **Charles Street** **(0.2 miles)**
3. Turn right on **9th Street** **(0.2 miles)**
4. Turn right on **East State Street/HWY 20** **(0.1 miles)**

Distance: 2.27 miles
Approximate Travel Time: 7 minutes

MAPQUEST

Start: **2421 11th St**
Rockford, IL 61104-7217, US

End: **1401 E State St**
Rockford, IL 61104-2315, US

Notes:

Directions		Distance
Total Est. Time: 7 minutes	**Total Est. Distance:** 2.27 miles	
START	**1:** Start out going NORTH on 11TH ST toward 23RD AVE.	1.5 miles
	2: Turn LEFT onto CHARLES ST.	0.2 miles
	3: Turn RIGHT onto 9TH ST.	0.2 miles
	4: Turn RIGHT onto E STATE ST / US-20 BR.	0.1 miles
END	**5:** End at **1401 E State St** Rockford, IL 61104-2315, US	
Total Est. Time: 7 minutes	**Total Est. Distance:** 2.27 miles	

ORBITZ Map out great hotel rates on Orbitz

Start:
2421 11th St
Rockford, IL 61104-7217, US

End:
1401 E State St
Rockford, IL 61104-2315, US

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These directions are informational only. No representation is made or warranty given as to their content, road conditions or route usability or expeditiousness. User assumes all risk of use. MapQuest and its suppliers assume no responsibility for any loss or delay resulting from such use.

ATTACHMENT 4
UTILITY CLEARANCE LOG(s)/CHECKLIST

ATTACHMENT 4
PRE-DRILLING/EXCAVATION CHECKLIST AND UTILITY CLEARANCE LOG

PROJECT:			
LOCATION:		**DATE:**	
UTILITY LOCATOR:		**UTILITY LOCATOR PHONE #:**	
DATE OF LOCATOR REQUEST:		**LOCATOR CALL REFERENCE #:**	

Instructions. This checklist is to be completed by SECOR personnel prior to initiation of field activities as a safety measure to insure that all underground utility lines, other underground structures and above-ground power lines are clearly marked in the area selected for boring or excavation. **DRILLING OR EXCAVATION WORK MAY NOT PROCEED UNTIL _____(fill in the name of the utility service) HAS BEEN CONTACTED AND THIS CHECKLIST HAS BEEN COMPLETED. IF ANY OF THE QUESTIONS ANSWERED BELOW ARE ANSWERED "NO", THEN PROJECT MANAGER MUST BE CONTACTED AND CONCERNS/ISSUES DISCUSSED**. Document the reason for a "NO" answer on the back of this form.

Type of Utilities and Structures	**Not Present**	**Present**	**How Marked** (Flags, paint on pavement, wooden stakes, etc.)
Electric			
Natural Gas			
Telephone – Communication			
Water			
Sanitary Sewer			
Storm Sewer			
Facility Process Lines			
Septic tank/drain field			
Other			

YES	**NO**	**PRE-MOBILIZATION**
		Is a scaled site plan, map or drawing showing the proposed borehole locations attached to this form?
		Does each borehole location allow for clear entry and exit, adequate workspace, and a clear path for raising the mast and operating the drill rig and all support equipment? Ensure 20 feet of clearance distance between the mast and electrical lines (SECOR H&S Policy and 29 CFR 1926.550). Check with the power utility company.
		Are all of the proposed borehole locations and associated areas of pavement cutting at least 10 feet from any subsurface or above-ground utilities shown on client's building plans? SECOR PM check here □ if plans not provided by client (therefore not applicable to this job).
		Are all of the proposed borehole locations and associated areas of pavement cutting at least 10 feet from any subsurface or above-ground utilities shown on public right-of-way street improvement or other public property plan or site map? PM check here □ if not applicable to this job.
		Has the Site Representative, familiar with the site, such as a construction manager, indicated no knowledge of any subsurface or above-ground utilities within 10 feet of the proposed borehole locations? Is the Site Representative qualified to make such a determination?
		Are all of the proposed borehole locations and associated areas of pavement cutting at least 10 feet from any subsurface utilities identified during a geophysical survey? Applicable: Yes / No
		Have all Utility Locating Service providers notified by the public line locator marked out their facilities in the vicinity of the borehole locations or otherwise notified us that they do not have any facilities near the proposed borehole locations?
		Are all proposed borehole locations and associated areas of pavement cutting at least 10 feet from a visual line connecting two similar looking manhole covers?
		Are all proposed borehole locations and associated areas of pavement cutting at least 10 feet from a visual line perpendicular to the street from the water, gas, and electrical meters?
		Are all proposed boring locations and associated areas of pavement cutting clear of pavement joints, curbs, crash posts, or other engineered structures?
		Does the pavement lack signs of previous excavation (e.g. no pavement subsidence, no differences in pavement texture or relief, no pavement patching)? If there are signs, determine the purpose of the previous excavation and act accordingly.
		PRE-DRILLING
		Before drilling have you hand dug/used a water jet VacTron unit/tile probe/etc., to dig a hole 5 feet below grade if possible, and is the diameter of the hole greater than the outer diameter of the drilling auger?
		Does the soil you encountered in the hand-dug hole appear to be native material (i.e. free of clean gravel, clean sand, aggregate base [gravelly sand with ~10% fines], or other non-native looking material)?
		Have you made sure that you have identified all the expected utilities or have made sure that you can explain any missing utilities?

Have the above concerns been discussed with the SECOR Project Manager? Yes / No
Have the above concerns been discussed with the client? Yes / No
Have you made a reasonable effort to resolve the above issues? Yes / No
Approval to proceed provided by: Client Representative Name _____ Title and Date: _____
Approval to proceed provided by: SECOR Representative Name _____ Title and Date: _____
SECOR Field Technician Name: _____ Title and Date: _____

ATTACHMENT 5
MONITORING

ATTACHMENT 5a
EQUIPMENT CALIBRATION/CHECK LOG

DATE	INSTRUMENT/ MODEL NO.	SERIAL NO.	BATTERY CHECK OK?	ZERO ADJUST OK?	CALIBRATION GAS (PPM)	READING (PPM)	LEAK CHECK	PERFORMED BY	COMMENTS

* Submit copies of logs to Director of Industrial Hygiene & Health and Safety, Philip A. Platcow, CIH within 24 hours, if a PEL is exceeded, or personal protective equipment level is upgraded at (617) 232-7355 or via email at pplatcow@secor.com

ATTACHMENT 5b
MONITORING LOG

Instrument(s) Used: Make: _____ Model: _____

DATE	TIME	LOCATION/SOURCE (Personal/Area Sampling)	WORK ACTIVITY DURING SAMPLING (Be specific)	Measurement (Units)	WHAT DID YOU DO BECAUSE OF THE RESULT? (PPE Change/Activity Change/Nothing Needed)	SAMPLED BY

* Submit copies of logs to Director of Industrial Hygiene & Health and Safety, Philip A. Platcow, CIH within 24 hours, if a PEL is exceeded, or personal protective equipment level is upgraded at (617) 232-7355 or via email at pplatcow@secor.com

ATTACHMENT 6
SAFE DRIVING PROCEDURES

ATTACHMENT 6a
JOURNEY HAZARD ASSESSMENT CARD

STOP! THINK! GO!

Name _____ **Date** _____

STOP

Do I need to make this journey? ❑ **Yes** ❑ **No**

STOP

Where am I traveling? How long will I be driving?
And do I have an ETA with a contact person?
Have I communicated area hazards and safest mode of transport?

THINK

How can I ensure that I have a safe journey?

THINK

Am I well rested an alert for the journey? ❑ **Yes** ❑ **No**

THINK

Have I done a complete vehicle walk around and ensured that the vehicle is safe and ready for travel? ❑ **Yes** ❑ **No**

ELEMENTS OF THE DRIVING STANDARD

- **Has vehicle been inspected?** ❑ **Yes** ❑ **No**
- **Will passengers be transported?** ❑ **Yes** ❑ **No**
- **Has cargo been secured?** ❑ **Yes** ❑ **No**
- **Driver's License is current?** ❑ **Yes** ❑ **No**
- **Appropriately rested and alert?** ❑ **Yes** ❑ **No**
- **Journey risks have been identified?** ❑ **Yes** ❑ **No**
- **Seatbelts are in working order?** ❑ **Yes** ❑ **No**
- **Medically fit for driving?** ❑ **Yes** ❑ **No**

HAVE A SAFE TRIP!

DRIVING IS RISKY BUSINESS!

JOURNEY HAZARD ASSESSMENT CARD

STOP! THINK! GO!

Name _____ Date _____

STOP

Do I need to make this journey? ❑ **Yes** ❑ **No**

STOP

Where am I traveling? How long will I be driving?
And do I have an ETA with a contact person?
Have I communicated area hazards and safest mode of transport?

THINK

How can I ensure that I have a safe journey?

THINK

Am I well rested an alert for the journey? ❑ **Yes** ❑ **No**

THINK

Have I done a complete vehicle walk around and ensured that the vehicle is safe and ready for travel? ❑ **Yes** ❑ **No**

ELEMENTS OF THE DRIVING STANDARD

- **Has vehicle been inspected?** ❑ **Yes** ❑ **No**
- **Will passengers be transported?** ❑ **Yes** ❑ **No**
- **Has cargo been secured?** ❑ **Yes** ❑ **No**
- **Driver's License is current?** ❑ **Yes** ❑ **No**
- **Appropriately rested and alert?** ❑ **Yes** ❑ **No**
- **Journey risks have been identified?** ❑ **Yes** ❑ **No**
- **Seatbelts are in working order?** ❑ **Yes** ❑ **No**
- **Medically fit for driving?** ❑ **Yes** ❑ **No**

HAVE A SAFE TRIP!

DRIVING IS RISKY BUSINESS!

ATTACHMENT 6b

Daily Vehicle Checklist

Employee Name:_____**Region/Business Unit:**_____

Date: _____ **Time:**_____**Vehicle Color:** _____

Job:_____**Vehicle Make/Model:** _____

Job # : _____ **Vehicle License Plate Number:** _____

Vehicle Mileage End:_____ **SECOR Vehicle** ☐

Vehicle Mileage Start: _____ **Rental Vehicle** ☐

Total Miles Driven: _____ **Personal Vehicle** ☐

Perimeter Walk Around:	Item is OK	Item is NOT OK
Check for signs of vandalism, negligence, damage or unusual conditions		
Check all tires for excessive and unusual wear and proper inflation – include the spare tire if it is easily accessible		
Check under vehicle for signs of leaking fluids		
Check wiper blades (Do they work? Need replacement?)		
Check all light systems – brake, head, back-up, running, turn signals, emergency flashers		
Check to make sure doors, truck/toolbox lids, tailgates all open and close properly (Make sure you have keys to any toolboxes that you may need to access)		
Check Gauges on Dashboard:	Item is OK	Item is NOT OK
Fuel Level		
Oil light		
Engine Coolant Temperature Gauge		
Service Indicator Lights		
Battery Charge Indicator		
Inside Vehicle:	Item is OK	Item is NOT OK
Make sure seatbelts are present for all who will be riding in the vehicle		
Secure all cargo in the vehicle so that items will not become projectiles in the event of sudden stops or collisions		
Adjust the seat position, rearview and side mirrors		
Adjust temperature controls, vents, radio, etc.		

Notify the vehicle manager or rental company if you feel that any deficiencies are unsafe and DO NOT drive the vehicle!

SIGNATURE: _____

Daily Vehicle Checklist

Employee Name:_____**Region/Business Unit:**_____

Date: _____ **Time:**_____**Vehicle Color:** _____

Job:_____**Vehicle Make/Model:** _____

Job # : _____ **Vehicle License Plate Number:** _____

Vehicle Mileage End:_____ **SECOR Vehicle** ☐

Vehicle Mileage Start: _____ **Rental Vehicle** ☐

Total Miles Driven: _____ **Personal Vehicle** ☐

Perimeter Walk Around:	Item is OK	Item is NOT OK
Check for signs of vandalism, negligence, damage or unusual conditions		
Check all tires for excessive and unusual wear and proper inflation – include the spare tire if it is easily accessible		
Check under vehicle for signs of leaking fluids		
Check wiper blades (Do they work? Need replacement?)		
Check all light systems – brake, head, back-up, running, turn signals, emergency flashers		
Check to make sure doors, truck/toolbox lids, tailgates all open and close properly (Make sure you have keys to any toolboxes that you may need to access)		
Check Gauges on Dashboard:	Item is OK	Item is NOT OK
Fuel Level		
Oil light		
Engine Coolant Temperature Gauge		
Service Indicator Lights		
Battery Charge Indicator		
Inside Vehicle:	Item is OK	Item is NOT OK
Make sure seatbelts are present for all who will be riding in the vehicle		
Secure all cargo in the vehicle so that items will not become projectiles in the event of sudden stops or collisions		
Adjust the seat position, rearview and side mirrors		
Adjust temperature controls, vents, radio, etc.		

Notify the vehicle manager or rental company if you feel that any deficiencies are unsafe and DO NOT drive the vehicle!

Signature: _____

ATTACHMENT 6c
JOURNEY MANAGEMENT PLAN(s)

PURPOSE

The purpose of this Journey Management Procedure (JMP) is to prevent losses associated with motor vehicle related incidents including: injuries to drivers, passengers and pedestrians, damage to motor vehicles and damage to third party property. By communicating potential safety risks before mobilizing to a site, a motor vehicle operator will be able to prepare for and avoid potential hazards.

SCOPE

This JMP applies to all vehicles assigned for the support of site operations, including company owned and personal use vehicles. This JMP does not apply to vendors (such as UPS, FedEx. etc.) not under contract with SECOR or their supplier. This JMP does not address hazards that are external to the site access/egress and on the onsite project operations.

SPECIAL NOTE

Because the site, weather and traffic conditions may change frequently the JMP shall be maintained and updated separate from the Site Health and Safety Plan.

Responsibilities

Contract Project Manager

The contract project manager is responsible to ensure that the site has a current Journey Management Plan.

Field Manager

The field manager is responsible to create and keep current a JMP that is appropriate for the site conditions. It is also the field manager's role to ensure each vehicle operator has a JMP that describes the conditions for his vehicle and equipment prior to mobilizing to the site. A common JMP may be used for several vehicles or as conditions dictate a separate JMP may be specific or unique to an individual vehicle.

Vehicle Operator

The assigned vehicle operator shall not mobilize to the site without first receiving the JMP. It is also the vehicle operator's responsibility to read and become familiar with the description and stipulations of the JMP prior to mobilizing to the site. DO NOT mobilize to the site to get clarification to the JMP. Because driving conditions may vary, vehicle operators shall also notify the field manager of any hazards not identified on the JMP so that the field manager can update the JMP. Because traffic conditions may change frequently on a project, the JMP shall be maintained and updated separate from the Site Health and Safety Plan.

Scope of this JMP

Describe the types of vehicles and equipment that are within the scope of this JMP such as: Pick-up trucks, dump trucks, drill rigs.

General Hazards

Describe the conditions/hazards that are more general such as those related to weather or time of day, lighting and the use of headlights and vehicle emergency flashers, the use of private services to manage traffic signs and barricades. You may want to describe the preferred walking routes for site workers. Headlights and hazard signals should be utilized on-Site.

Site Specific Hazards

Describe the conditions/hazards that are site specific such as those related to pedestrian traffic, bus stops, school zones, local traffic conditions, train tracks, and other local conditions. You may want to describe the preferred walking routes for site workers. Hidden corners, pedestrians, slow moving traffic (ie forklifts).

Directions: Access to the Site

Describe the recommended safe direction to gain access to the site and recommended direction to leave the site. This description shall take into consideration conditions and limitations caused by: local traffic conditions, road conditions, presence or lack of curb and gutter, bus stops, school zones, pedestrian walk ways, traffic lights, train tracks, etc. Specific directions may vary depending on the time of day if there are specific hazards such as school recesses, or local business traffic due to shift changes. The Site is best accessed from the 11th Street entrance to the South Alley of the facility from the west lane of 11th Street (Heading north).

Directions: Leaving the Site

Describe the recommended safe direction to leave the site. This description shall take into consideration conditions and limitations caused by: local traffic conditions, road conditions, bus stops, pedestrian walk ways, traffic lights, etc. The best egress from the South Alley or the facility is to go east to 11th Street and turn right (south).

Site Specific Restrictions and Controls

Directions to reference attached site sketch. Describe any site conditions that might be relevant such as height restrictions due to the business canopy or overhead power/phone lines. Describe any parking limitations or the number and size of vehicle restrictions. Describe the procedures used for positioning/backing vehicles and equipment such as: All vehicles with limited vision shall not be positioned into place or backed without a spotter to assist the vehicle operator. If relevant describe how 3rd party pedestrian walkways will be used and maintained. Describe as appropriate the roles and responsibilities of maintaining exclusion zone barricades, traffic control signs and markers, etc.

This Journey Management Plan is approved for use:

From: 11/06/06	Time: 12:00	To: 07/01/07	Time: 12:00

Journey Management Plan Created and Maintained by

Field Manager : Chris Armes	Cell: (414) 526-8136

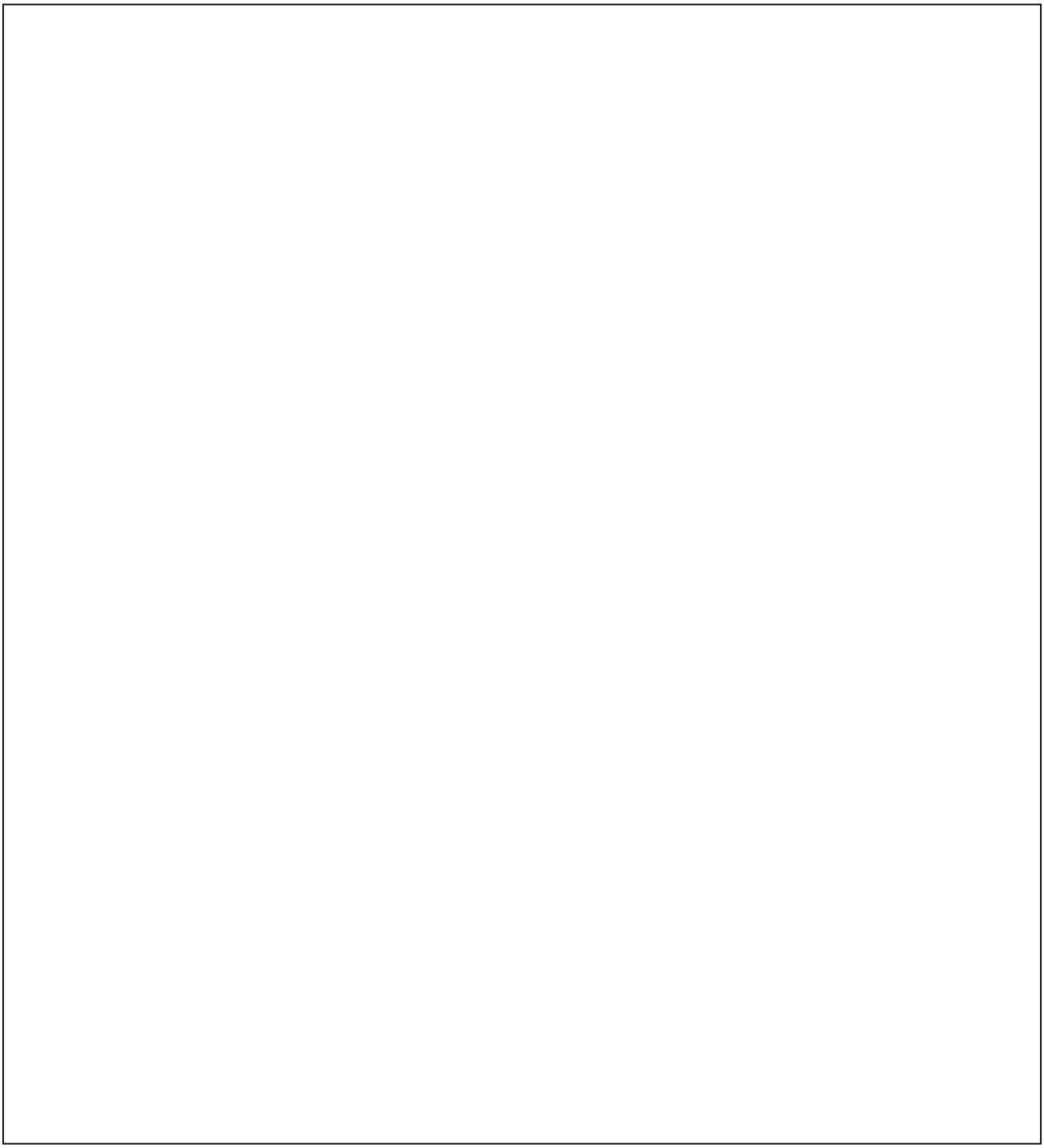
Contract Project Manager: Keith Wilcoxson	Cell: (630) 605-3196

CHANGES TO THE JOURNEY MANAGEMENT PLAN

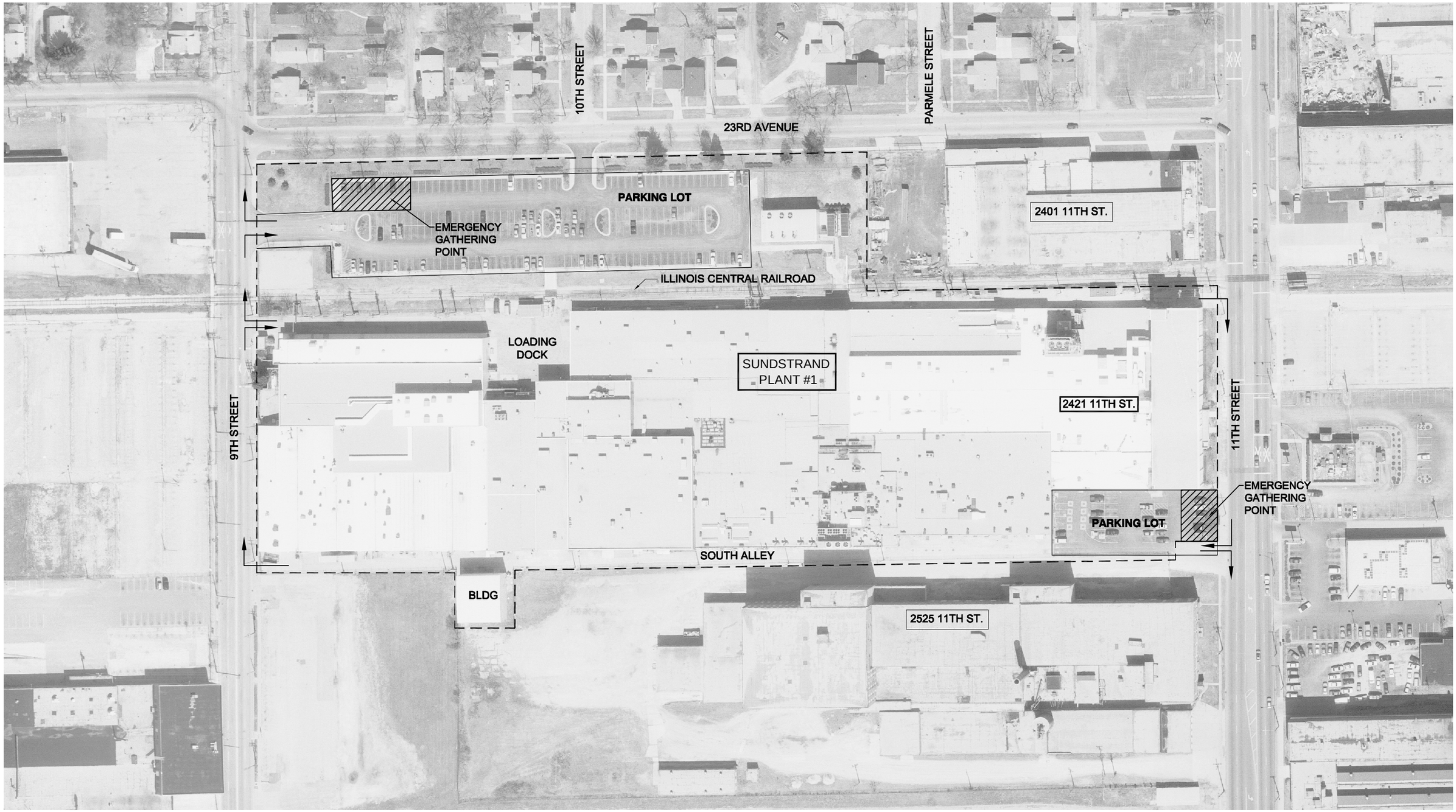
Date	Name	Change/Comment (be specific)

As appropriate create a sketch of the site. It can be helpful in clarifying access/egress routes, parking and positioning of equipment, traffic cones and other delineators.

Site Sketch



Because this is a sketch it can not be interpreted as accurate to scale.



LEGEND:

— — — PROPERTY BOUNDARY

0 120 240

APPROXIMATE SCALE (FEET)

N

SECOR
446 EISENHOWER LANE NORTH
LOMBARD, ILLINOIS 60148
PHONE:(630) 792-1680 FAX:(630) 792-1691

FOR: HAMILTON SUNDSTRAND ROCKFORD, ILLINOIS

SITE ACCESS, EGRESS ROUTES AND EMERGENCY GATHERING POINTS
HAMILTON SUNDSTRAND PLANT #1

FIGURE 1.4

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
13UN.02072.06.0001	GH/JC	CA		1/05/07

ATTACHMENT 6d

SECOR Vehicle Collision Kit

The following items should be enclosed in an envelope in the glove box of all SECOR vehicles:

- Vehicle Registration Card
- Vehicle Insurance Card with name and phone number of agent
- Name of Preferred Body Shop or Maintenance Facility to take damaged vehicle (usually nearest Dealership)
- Owners Manual
- Disposable Camera
- Note Pad and Pen

WHAT TO DO AFTER A COLLISION:

Auto collisions: Even the most careful drivers may be involved. Knowledge of what to do **after** the collision can make the experience a little less frightening and decrease the chance of unnecessary complications.

After a Collision

- Check for injuries. Life and health are more important than damage to vehicles.
- Make note of specific damages to all vehicles involved.
- Write down the names, addresses and license numbers of persons involved in the collision. Also, write a description of the other vehicles.
- Call the police, even if the collision is minor.
- Jot down names and addresses of anyone who may have witnessed the collision. This can prevent disagreement concerning how the collision actually happened.

Other Do's and Don'ts

- DO jot down details about the collision, the location, and circumstances such as weather conditions and visibility.
- DO notify your insurance agent about the collision immediately.
- DON'T sign any document unless it is for the police or your insurance agent.

Remember that a SECOR incident investigation form must also be completed following any collision. The collision must be reported to the SECOR Project Manager in addition to the following people:

Marguerite Shuffelton, Director of Human Resources:
Office 619-718-9430
Cell 619-925-8365
Home: 760-749-9603

Phil Platcow, Director of Industrial Hygiene/Health and Safety:
Office: 617-232-7355
Cell: 617-899-5403
Home: 617-739-1224

Michael Allen Philipp, West Region Health & Safety Manager
Office (619) 296-6195 X240 Fax (619) 296-6199
Cell (619) 985-4340
Home (858) 391-0347

Gay Matteson, SECOR Contracts
Office (425) 372-1672
Fax (425) 372-1700

COLLISION FORM

Driver's Name: _____Driver's Lic. No._____ Lic. Plate No._____
Make of Vehicle: _____Model: _____ Yr. _____ VIN No. _____
Date: _____ Time: _____
Location of Collision: _____
Specific Damages to the vehicle you were driving:_____
_____
_____
_____
_____
_____

Conditions:
Pavement □ Dry □ Wet □ Ice □ Snow Weather _____Visibility _____
Traffic Control □ Lights □ Signal □ None – indicate any traffic control on the schematic you draw
Police Investigation □ Yes □ No Officer Name and Badge No. _____
Name of Department: _____
* Request a copy of the police report for submission to the insurance company
Were citations issued? □ Yes □ No If yes, to whom and for what violation? _____

Other Motorists involved in the incident:
Name: _____ Address: _____
Phone Number: _____ Drivers License Number: _____
Lic. Plate No. _____ Make of Vehicle _____
Model _____ Yr. _____ VIN No. _____
Owner of Vehicle _____ Insurance Company Name: _____
Policy and Phone Number: _____Vehicle Speed _____
Direction of Travel: □ N □ E □ S □ W Description of Damage _____

Name: _____ Address: _____
Phone Number: _____ Drivers License Number: _____
Lic. Plate No. _____ Make of Vehicle _____
Model _____ Yr. _____ VIN No. _____
Owner of Vehicle _____ Insurance Company Name: _____
Policy and Phone Number: _____Vehicle Speed _____
Direction of Travel: □ N □ E □ S □ W Description of Damage _____

Other Person(s) who witnessed the incident:
Name: _____ Phone Number: _____
Address:_____

Name: _____ Phone Number: _____
Address:_____

Name: _____ Phone Number: _____
Address:_____

Property Damage other than Vehicles:

Owner _____Address_____

What was damaged _____

_____

Location of Property _____

_____

List all Persons Involved:

Name _____ Phone No _____

Address _____

□ Your Vehicle □ Other Vehicle □ Pedestrian Injured? □ No □ Yes, Describe _____

Name _____ Phone No _____

Address _____

□ Your Vehicle □ Other Vehicle □ Pedestrian Injured? □ No □ Yes, Describe _____

Name _____ Phone No _____

Address _____

□ Your Vehicle □ Other Vehicle □ Pedestrian Injured? □ No □ Yes, Describe _____

Name _____ Phone No _____

Address _____

□ Your Vehicle □ Other Vehicle □ Pedestrian Injured? □ No □ Yes, Describe _____

Brief Description of Photos Taken:

Use this paper to draw a schematic of the collision – indicate North on schematic for reference
Describe what happened below the schematic

IF AN ACCIDENT OCCURS AFTER SECOR'S NORMAL WORKING HOURS PLEASE REPORT YOUR CLAIM TO KIBBLE & PRENTICE INSURANCE AGENT, PHONE NO 425-454-2445, FAX NO 425-646-9616 - AFTER HOURS PHONE NO 425-681-1349

ACORD CERTIFICATE OF LIABILITY INSURANCE

OP ID: JJ1 SECOR-1 | DATE (MM/DD/YYYY): 10/26/06

PRODUCER

Kibble & Prentice
P O Box 370
' ttle WA 98111
- one: 206-441-6300 Fax: 206-508-6081

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE | **NAIC #**

INSURED

SII Holdings, Inc
SECOR International
Incorporated
PO Box 230
Redmond WA 98073-0230

INSURER A:	Zurich American Insurance Co.	
INSURER B:	Steadfast Insurance Co	
INSURER C:		
INSURER D:		
INSURER E:		

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A		GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS MADE [X] OCCUR X Owner/Cont Prot. GEN'L AGGREGATE LIMIT APPLIES PER: POLICY [X] PRO-JECT [ ] LOC	GLO522247705	11/02/06	11/02/07	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 250,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A		AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS	BAP522248505	11/02/06	11/02/07	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
		GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EA ACC AGG	$ $ $
B		EXCESS/UMBRELLA LIABILITY X OCCUR [X] CLAIMS MADE DEDUCTIBLE X RETENTION $10000	SE052224905	11/02/06	11/02/07	EACH OCCURRENCE AGGREGATE Including Prof Poll	$ 2,000,000 $ 2,000,000 $ $ $
A		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below	WC900684603 WC900923103	11/02/06	11/02/07	X WC STATU-TORY LIMITS / OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
B		OTHER Pollution Occurren Prof. Claims Made	PEC522247505	11/02/06	11/02/07	1,000,000 1,000,000	Occ/CL Made Aggregate

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

Evidence of Insurance for General Liability, Auto Liability, Workers Compensation, Professional/Pollution Liability and Excess Liability including the Professional/Pollution coverage.

CERTIFICATE HOLDER

TOWHOM

TO WHOM IT MAY CONCERN

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

ACORD 25 (2001/08)

© ACORD CORPORATION 1988

Incident Investigation Report

Consider using the Root Cause Analysis PROACTIVELY to avoid incidents and near misses.

INCIDENT TYPE (To be filled in by Human Resources Department)			**Date of Incident:**
☐ Fatality	☐ Industrial Non-Recordable	☐ Spill/Leak	☐ General Liability
☐ Lost Workday	☐ Non-Industrial	☐ Product Integrity	☐ Criminal Activity
☐ LW Restricted Duty	☐ Off-the-Job Injury	☐ Equipment	☐ Notice of Violation
☐ OSHA Medical or Illness w/o LW	☐ MVA	☐ Business Interruption	☐ Near Miss
☐ First Aid	☐ Fire		

The SECOR Project Manager, Human Resources and Corporate Health & Safety must be informed immediately after stabilizing the victim(s)/site as the result of an incident or near miss. The investigation of the incident or near miss by the employee's supervisor or Site Health and Safety Officer must also begin immediately. This report must be completed as soon as possible, in most cases within the week of the incident. It must be reviewed and signed by the Principal and e-mailed or faxed to the Vice President of Human Resources, and Corporate Health and Safety (numbers at end), even if employee is not available to review and sign. Employee or employee's doctor must submit a copy of the doctor's report to Human Resources within 24 hours of the initial exam and any subsequent exams. Contact information at end of report.

EMPLOYER (Include sub-contractors, or other employers on our sites)

Company Name:					
Work Location Address where incident occurred:			Project Name:		

EMPLOYEE

Name:	
Employment Status: ☐Full-Time ☐Part-Time ☐Hourly-As-Needed	How long in present job?

INJURY OR ILLNESS INFO

Where did incident / near miss occur? (number, street, city, state, zip):	
County:	On Employer's premises? ☐Yes ☐ No
Specific activity the employee was engaged in when the incident / near miss occurred:	
All equipment, materials, or chemicals the employee was using when the incident / near miss occurred (e.g., the machine employee struck against or which struck employee; the vapor inhaled or material swallowed; what the employee was lifting, pulling, etc.):	
Describe the specific injury or illness (e.g., cut, strain, fracture, skin rash, etc.):	
Body part(s) affected (e.g., back, left wrist, right eye, etc.):	
Name and address of Health Care Provider (e.g., physician or clinic):	Phone No.:
If hospitalized, name and address of hospital:	Phone No.:
Date of injury or onset of illness(MM/DD/YYYY) / /	Time of event or exposure: ☐AM ☐ PM
Time employee began work: ☐ AM ☐ PM	Did employee lose at least one full shift's work? ☐ No ☐ Yes, 1st date absent (MM/DD/YYYY) / /
Has employee returned to work? ☐ Regular work ☐ Restricted work ☐ No, still off work ☐ Yes, date returned (MM/DD/YYYY) / /	
Did employee die? ☐ No ☐ Yes, date (MM/DD/YYYY) / /	
Date employer notified of incident / near miss: (MM/DD/YYYY) / /	
To whom reported:	
Other workers injured/made ill in this event? ☐ Yes ☐ No	

Description of Incident / Near Miss: (Describe fully the incident / near miss events. Tell exactly what happened and how it happened so that someone could recreate the incident or near miss. Use extra paper if you need.)									
Weather (Fog, rain, ice, sunshine, windy, extreme temperatures – report in degrees F or C)									
Motor Vehicle Accident (MVA) - You may also have to fill out an insurance form-Call Corporate Contracts Dept. (425) 372-1600						Professional Driver? ☐Yes ☐No			
Total Years Driving:		Company Vehicle? ☐ Yes ☐ No				Operation Type:		Accident Situation:	
Truck Transportation:		Years with Carrier:		Vehicle Type:				Equipment #:	
Accident Location (street, city, state):									
Hazardous Material? ☐ Yes ☐ No		Reportable? ☐ Yes ☐ No		No. of Vehicles Towed		No. of Injuries:		No. of Fatalities:	
Spill/Leak/Product Quality									
Product Name		Quantity		Product 2 Name		Quantity		Product 3 Name	Quantity
Agency Notifications									
Estimated Cost of Incident	$								
Third Party Incidents									
Name of Owner		Address				Telephone			
Description of Damage:									
Witness Name		Address				Telephone			
Witness Name		Address				Telephone			

 # Root Cause and Contributing Factors: Conclusion (Describe in Detail Why Incident / Near Miss Occurred)
1
2
3

Root Cause(s) Analysis (RCA) - Use proactively to avoid Incidents and Near Misses.

1) Deficiency in task related ability or knowledge
2) Deficiency in Standard Operating Procedures or Job Safety Analysis
3) Deficiency in the transference of information concerning the Standard Operating Procedures or JSA steps.
4) Deficiency or lack of the proper tools or equipment.
5) Proper execution requires increased time or effort.
6) Improper procedures and performance is accepted and allowed.
7) Previous improper performance of a task did not result in adverse results.
8) Beyond the control of the Supervisor/worker(s).

#	RCA #	Solution(s): How to Prevent Incident / Near Miss From Reoccurring	Person Responsible	Due Date	Closure Date

Investigation Team Members		
Name	Job Title	Date

Results of Solution Verification and Validation - after implementing solutions to make sure they work.

Reviewed By		
Name	Job Title	Date

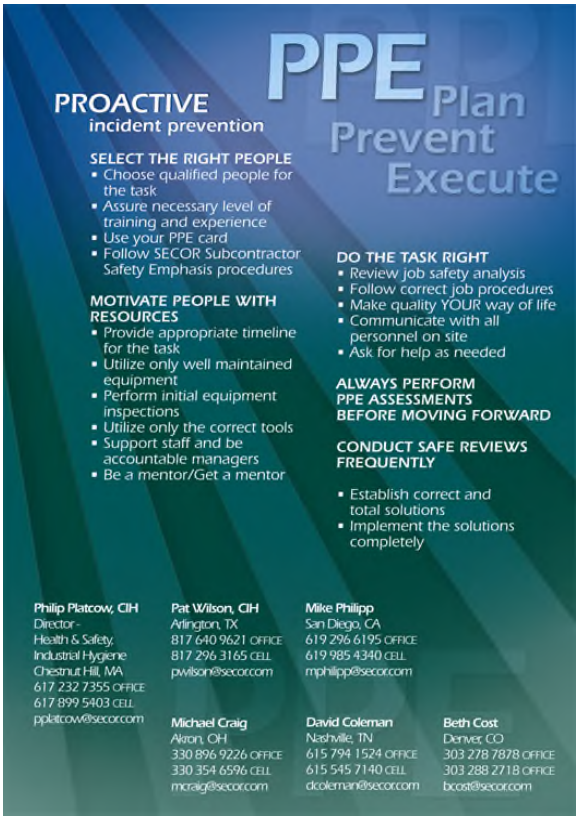
Acknowledgment Signatures for Injuries/Illnesses		
Title	**Signature**	**Date**
Director of HR: Marguerite Shuffelton		
Director of IH/H&S: Philip Platcow		
NAM:		
Regional Managers:		
Frank Aceto		
Oren Gottlieb		
Jim Grasty		
Russ Hamblin		
Sr. Vice President: David Childs		
Chief Executive Officer: Jim Vais		

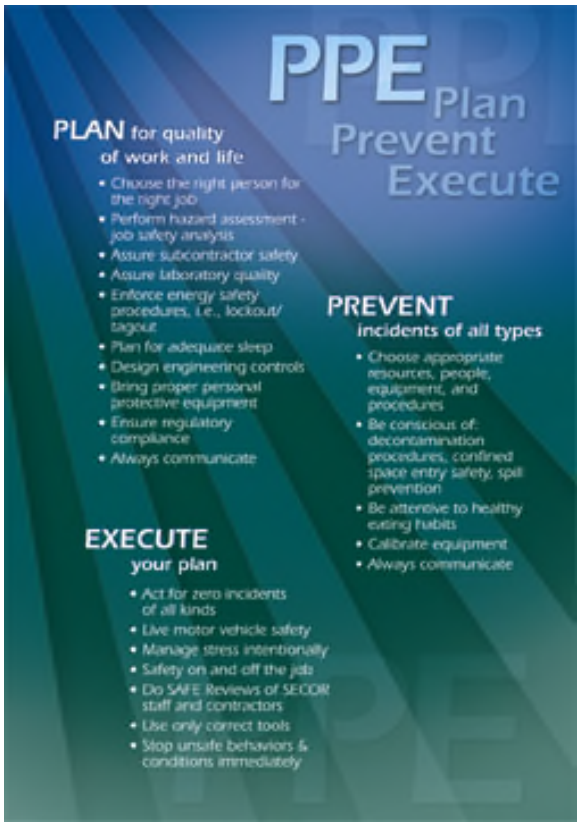
Contact information.
Call Human Resources and Corporate H&S Immediately.

HR: Mary Harris Phone: 619-718-9429, Fax: 619-296-2006, E-Mail: mharris@secor.com. After hours or weekends, please call Marguerite Shuffelton Cell: 619-925-8365 or Home 760-749-9603.

Health & Safety: Call Philip Platcow and Michael Philipp
Philip Platcow: 617-232-7355; fax 801-340-8657 Email: pplatcow@secor.com.
After hours or weekends, cell: 617-899-5403 or Home 617-739-1224; and
Mike Philipp 619-296-6195; fax 619-296-6199 Email: mphilipp@secor.com. After hours or weekends, cell: (619) 985-4340

Fax report to all three.





ATTACHMENT 7
PERMITS

ATTACHMENT 8
ADDITIONAL PHYSICAL AND BIOLOGICAL CONCERNS

Heat Exhaustion

What are the symptoms?

HEADACHES; DIZZINESS OR LIGHTHEADEDNESS; WEAKNESS; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; UPSET STOMACH; VOMITING; DECREASED OR DARK-COLORED URINE; FAINTING OR PASSING OUT; AND PALE, CLAMMY SKIN

What should you do?

- Act immediately. If not treated, heat exhaustion may advance to heat stroke or death.
- Move the victim to a cool, shaded area to rest. Don't leave the person alone. If symptoms include dizziness or lightheadedness, lay the victim on his or her back and raise the legs 6 to 8 inches. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

Heat Stroke–A Medical Emergency

What are the symptoms?

DRY, PALE SKIN WITH NO SWEATING; HOT, RED SKIN THAT LOOKS SUNBURNED; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; SEIZURES OR FITS; AND UNCONCIOUSNESS WITH NO RESPONSE

What should you do?

- Call 911 for emergency help immediately.
- Move the victim to a cool, shaded area. Don't leave the person alone. Lay the victim on his or her back. Move any nearby objects away from the person if symptoms include seizures or fits. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) if alert enough to drink something, unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or wiping the victim with a wet cloth or covering him or her with a wet sheet.
- Place ice packs under the armpits and groin area.

How can you protect yourself and your coworkers?

- Learn the signs and symptoms of heat-induced illnesses and how to respond.
- Train your workforce about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Build up tolerance to the heat and the work activity slowly. This usually takes about 2 weeks.
- Use the buddy system, with people working in pairs.
- Drink plenty of cool water, about a cup every 15 to 20 minutes.
- Wear light, loose-fitting, breathable clothing, such as cotton.
- Take frequent, short breaks in cool, shaded areas to allow the body to cool down.
- Avoid eating large meals before working in hot environments.
- Avoid alcohol or beverages with caffeine. These make the body lose water and increase the risk for heat illnesses.

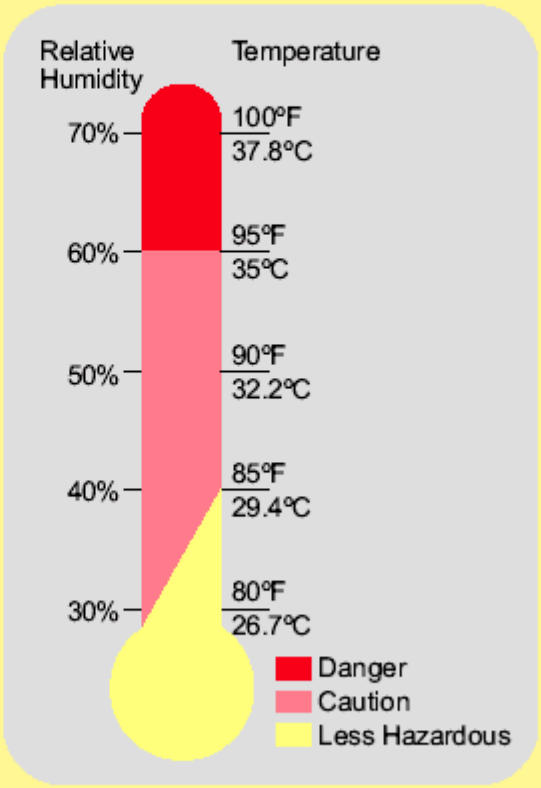
What factors put you at increased risk?

- Taking certain medications. Check with your health-care provider or pharmacist to see if any medicines you are taking affect you when working in hot environments.
- Having a previous heat-induced illness.
- Wearing personal protective equipment such as a respirator or protective suit.

The Heat Equation

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are heat exhaustion and heat stroke. If left untreated, **heat exhaustion** could progress to **heat stroke** and possible **death**.



U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 3154
2002

Bee/Wasp Precautions

Revision Date: April 13, 2004

Purpose

Bees and similar organisms such as wasps, hornets and yellow jackets can cause significant injury, pain and/or discomfort during our work. This precaution has been developed to help avoid injury.

13.1.1.1

13.1.1.2 Application

We can encounter these organisms during a number of our tasks such as:

- Opening well vault covers
- Opening core or sample boxes
- Performing O & M in system compounds
- Working in tall grass, weeds and brush
- Performing site assessments (indoors and outdoors)

Yellow Jackets

Yellow Jackets are found throughout the United States. Yellow Jackets feed on insects, spiders and a wide variety of other food items. They are medium-sized, stout-bodied, and black with bright yellow bands. Yellow-jackets construct globular paper nests, usually in underground cavities. Favorite nesting places include rodent burrows, compost piles and wall voids.

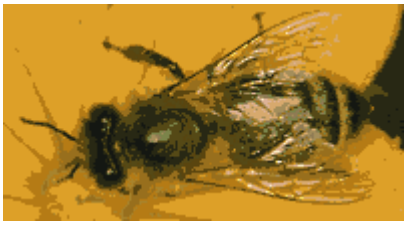
Yellow Jackets are scavengers and frequently are found foraging around compost piles and garbage receptacles. Their activity can be discouraged in the vicinity of patios, parks, picnic and other recreational areas by covering all food and disposing of waste in covered containers.

Paper Wasps

Paper wasps are about 1" in length, have a spindle-shaped body and are marked with a brown and yellow pattern. Paper wasps construct umbrella-shaped, single-layered nests with exposed cells. Nests may be built in trees and shrubs but frequently are found under building overhangs, in attics, barns, garages and sheds. These wasps are not considered overly aggressive and usually pose a threat only when their nests are disturbed. However, foraging wasps can cause considerable annoyance as they fly in and about entrances of buildings.

Honey Bees

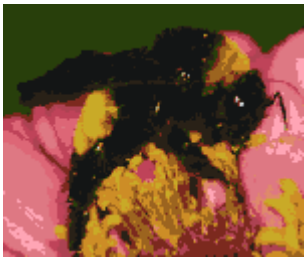
Honey bees may become troublesome when they swarm or build colonies in or near residential areas.



Honeybees occasionally invade homes and establish a colony, building combs of wax containing honey, pollen and brood in wall spaces. Once established, a colony is difficult to remove because it usually involves structural modification of the building. To be effective, the honey and wax should be removed along with the bees or the site will remain attractive to other swarms.

Bumble Bees

These bees most commonly become a problem when they establish nests close to a sidewalk or near building foundations. Bumble bees are large, robust bees covered with dense black and yellow hairs. They commonly reach one inch in length. Bumble bees usually are not overly aggressive, but will sting if molested. To avoid confrontations with bumble bees, stay clear of patches of flowers visited by adults. These bees can be controlled by spraying or dusting insecticides into their nests. Retreatment may be necessary.



What to do?

Naturally, there are many kinds of bees, and other insects for that matter, about which we should be concerned. The following are some good rules of thumb to keep in mind.

1. The best way to avoid being stung is to avoid the insect. Remember, almost all of these insects sting to protect their colony.
2. Keep your eyes and ears open for swarms.
3. Look for insects flying in or out of openings such as a crack in the wall, an open pipe end or a well vault lid.
4. Be careful of tall grass as some bees build their hives at ground level.
5. Be careful of pointed structures, especially in barns, storage sheds, outbuildings as bees often build hives in those structures.
6. Avoid wearing citrus or floral aftershaves or perfumes, they are sensitive to odors.
7. Wear light colored clothing, experience shows these insects are attracted to dark colors.
8. Fill in cracks or crevices, close open ends of pipes
9. Once you rile up these insects, the best thing you can do is run away as fast as possible. Do not retrieve nearby belongings. Do not run into traffic. Do not stand still, you can't fool them. Do not try to fight them, such as flail you arms or slap at them. This will upset them more. Just keep running. Africanized bees have chased people for more than a ¼ of a mile. Any covering for your body, especially your head and face, will enhance your escape. If nothing else pull your shirt up over your face. A few bites on your belly and chest won't be as bad as a few bites to your face and eyes can be. Although tempting, do not jump into water. They will wait for you to come up for air.
10. Staff should know if they are allergic to bee stings and carry an epipen with them.
11. Project managers should find out who on their staff are allergic and emphasize the importance of them obtaining and carrying an epipen.

Insect Sting Reactions

Insect sting reactions can be classified into three types - a normal reaction, a toxic reaction, and an

allergic reaction. A normal reaction, lasts only a few hours, involves pain, redness, swelling, itching, and warmth at the site of the sting. A toxic reaction lasts for several days, results from multiple stings and causes muscle cramps, headache, fever, and drowsiness. An allergic reaction is similar to a toxic reaction but is triggered with only one sting.

An allergic reaction can involve one or more of the following: hives, itching, and swelling in areas other than the sting site; tightness in the chest and difficulty in breathing; a hoarse voice or swelling of the tongue; dizziness or a sharp drop in blood pressure; and unconsciousness or cardiac arrest.

First Aid

In the event that someone is bitten by these insects, do the following.

1. Wash the bite area with soap and water.
2. Meat tenderizer, which contains an enzyme that breaks down the venom, and/or a baking soda paste also may be applied to the sting site to help relieve pain. Several over-the-counter sting remedies are available at pharmacies.
3. If you have been bitten over fifteen times or are having symptoms other than pain and swelling, seek emergency medical assistance immediately.
4. Use your epipen if you are allergic.
5. Have Benadryl in your first aid kit.

Questions?

Call Philip Platcow, CIH, Director of Industrial Hygiene and Health & Safety if you have questions (617) 232-7355 or email pplatcow@secor.com.

ATTACHMENT 9
MATERIAL SAFETY DATA SHEETS

eXtended release formula Hydrogen Release Compound (HRC-X™)
MATERIAL SAFETY DATA SHEET (MSDS)

Last Revised: March 24, 2004

Section 1 - Material Identification

Supplier:

REGENESIS

1011 Calle Sombra
San Clemente, CA 92673

Phone: 949.366.8000

Fax: 949.366.8090

E-mail: info@regenesis.com

Chemical Name:	Propanoic acid, 2-[2-[2-(2-hydroxy-1-oxopropoxy)-1-oxopropoxy]-1-oxopropoxy]-1,2,3-propanetriyl ester
Chemical Family:	Organic Chemical
Trade Name:	*eXtended release formula* Hydrogen Release Compound (HRC-X™), Glycerol tripolylactate and Glycerol
Product Use:	Used to remediate contaminated soil and groundwater (environmental applications)

Section 2 – Chemical Identification

CAS#	Chemical
201167-72-8	Glycerol Tripolylactate
56-81-5	Glycerol
50-21-5	Lactic Acid

Section 3 - Physical Data

Melting Point:	Not Available (NA)
Boiling Point:	Not Determined (ND)
Flash Point:	ND
Density:	1.3 g/cc
Solubility:	Acetone and DMSO
Appearance:	Viscous amber gel/liquid
Odor:	Not detectable
Vapor Pressure:	None

Section 4 - Fire and Explosion Hazard Data

Extinguishing Media: Carbon Dioxide, Dry Chemical Powder or Appropriate Foam.

Water may be used to keep exposed containers cool.

For large quantities involved in a fire, one should wear full protective clothing and a NIOSH approved self contained breathing apparatus with full face piece operated in the pressure demand or positive pressure mode as for a situation where lack of oxygen and excess heat are present.

Section 5 - Toxicological Information

Acute Effects:	May be harmful by inhalation, ingestion, or skin absorption. May cause irritation. To the best of our knowledge, the chemical, physical, and toxicological properties of the glycerol tripolylactate have not been investigated. Listed below are the toxicological information for glycerol and lactic acid.
RTECS#:	MA8050000 Glycerol

Section 5 - Toxicological Information (cont)

Irritation data:	SKN-RBT 500 MG/24H MLD 85JCAE-,207,1986 EYE-RBT 126 MG MLD EYE-RBT 500 MG/24H MLD SKN-RBT 5MG/24H SEV EYE-RBT 750 UG SEV	BIOFX* 9-4/1970 85JCAE-,207,1986 85JCAE -,656,86 AJOPAA 29,1363,46
Toxicity data:	ORL-MUS LD50:4090 MG/KG FRZKAP (6),56,1977 SCU-RBT LD50:100 MG/KG ORL-RAT LD50:12600 MG/KG IHL- RATLC50:>570MG/M3/1HBIOFX*9- 4/1970 IPR-RAT LD50: 4420 MG/KG IVN-RAT LD50: 5566 MG/KG SCU-MUS LD50: 91 MG/KG IPR-MUS LD50: 8700 MG/KG IVN-MUS LD50: 4250 MG/KG ORL-RBT LD50: 27 GM/KG SKN-RBT LD50:>10GM/KG IVN-RBT LD50: 53 GM/KG ORL-GPG LD50: 7750 MG/KG ORL-RAT LD50:3543 MG/KG SKN-RBT LD50:>2 GM/KG ORL-MUS LD50: 4875 MG/KG ORL-GPG LD50: 1810 MG/KG ORL-QAL LD50: >2250 MG/KG	NIIRDN 6,215,1982 FEPRA7 4,142,1945 RCOCB8 56,125,1987 ARZNAD 26,1581,1976 NIIRDN 6,215,1982 ARZNAD 26,1579,1978 JAPMA8 39,583,1950 DMDJAP 31,276,1959 BIOFX* 9-4/1970 NIIRDN 6,215,1982 JIHTAB 23,259,1941 FMCHA2-,C252,91 FMCHA2-,C252,91 FAONAU 40,144,67 JIHTAB 23,259,41 FMCHA2-,C252,91
Target Organ data:	Behavioral (headache), gastrointestinal (nausea or vomiting), Paternal effects (spermatogenesis, testes, epididymis, sperm duct), effects of fertility (male fertility index, post-implantation mortality).	
RTECS#:	OD2800000	
	Lactic acid	

Only selected registry of toxic effects of chemical substances (RTECS) data is presented here. See actual entry in RTECS for complete information on lactic acid and glycerol.

Section 6 - Health Hazard Data

Handling:	**Avoid continued contact with skin. Avoid contact with eyes.**

In any case of any exposure which elicits a response, a physician should be consulted immediately.

First Aid Procedures

Inhalation:	**Remove to fresh air. If not breathing give artificial respiration. In case of labored breathing give oxygen. Call a physician.**
Ingestion:	**No effects expected. Do not give anything to an unconscious person. Call a physician immediately.**
Skin Contact:	**Flush with plenty of water. Contaminated clothing may be washed or dry cleaned normally.**
Eye contact:	**Wash eyes with plenty of water for at least 15 minutes lifting both upper and lower lids. Call a physician.**

Section 7 - Reactivity Data

Conditions to Avoid:	**Strong oxidizing agents, bases and acids**
Hazardous Polymerization:	**None known**
Further Information:	**Hydrolyses in water to form Lactic Acid and Glycerol.**

Section 8 - Spill, Leak or Accident Procedures

After Spillage or Leakage:	**Neutralization is not required. This material may be burned in a chemical incinerator equipped with an afterburner and scrubber.**
Disposal:	**Laws and regulations for disposal vary widely by locality. Observe all applicable regulations and laws. This material, may be disposed of in solid waste. Material is readily degradable and hydrolyses in several hours.**

No requirement for a reportable quantity (CERCLA) of a spill is known.

Section 9 - Special Protection or Handling

Should be stored in plastic lined steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass containers.

Protective Gloves:	Vinyl or Rubber
Eyes:	Splash Goggles or Full Face Shield Area should have approved means of washing eyes.
Ventilation:	General exhaust.
Storage:	Store in cool, dry, ventilated area. Protect from incompatible materials.

Section 10 - Other Information

This material will degrade in the environment by hydrolysis to lactic acid and glycerol. Materials containing reactive chemicals should be used only by personnel with appropriate chemical training.

The information contained in this document is the best available to the supplier as of the time of writing. Some possible hazards have been determined by analogy to similar classes of material. No separate tests have been performed on the toxicity of this material. The items in this document are subject to change and clarification as more information becomes available.

CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

BENZENE

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Section 1 - Product and Company Identification
BENZENE

Product Identification: BENZENE
Date of MSDS: 01/01/1985 **Technical Review Date:** 02/29/1984
FSC: 6810 **NIIN:** 00-973-8588
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: BURDICK & JACKSON LAB (SEE SUP DATA)

Manufacturer's Address1: 1953 S HARVEY STREET
Manufacturer's Address2: MUSKEGON, MI 49442-6101
Manufacturer's Country: US
General Information Telephone: 616-726-3171
Emergency Telephone: 616-726-3171
Emergency Telephone: 616-726-3171
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: BURDI
Special Project Code: N

Item Description

Item Name: BENZENE,ACS
Item Manager:
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue:
Unit of Issue Quantity:
Type of Container: BOTTLE,GLASS

Contractor Information

Contractor's Name: BURDICK & JACKSON, INC.
Contractor's Address1: 1953 S. HARVEY STREET
Contractor's Address2: MUSKEGON, MI 49442
Contractor's Telephone: 616-726-3171
Contractor's CAGE: BURDI

Contractor Information

Contractor's Name: BURDICK AND JACKSON DIV OF BAXTER HEALTHCARE CORP.
Contractor's Address1: 1953 S HARVEY STREET
Contractor's Address2: MUSKEGON, MI 49442-6101
Contractor's Telephone: 616-726-3171, CHEMTREC 800-424-9300
Contractor's CAGE: 2H215

Section 2 - Compositon/Information on Ingredients
BENZENE

Ingredient Name: BENZENE (SARA III)
Ingredient CAS Number: 71-43-2 **Ingredient CAS Code:** M
RTECS Number: CY1400000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:

% Low Volume: **% Low Volume Code:**
% High Volume: **% High Volume Code:**
% Text: >90
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 1PPM/5STEL;1910.1028 **OSHA PEL Code:** M
OSHA STEL: **OSHA STEL Code:**
ACGIH TLV: 10 PPM; A2; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
BENZENE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
EYE: IRRIT. VAPOR: DIZZY,NAUSEA,INCOORDINATION,STUPOR,UNCONSCIOUSNESS & CHANGE IN BLOOD COMPOSITION.

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
BENZENE

First Aid:
EYE: FLUSH WITH WATER 15 MIN,GET MED ATTN. INHALATION: REMOVE FROM EXPOSURE,GIVE ARTIFICIAL RESPIRATION IF NEEDED,GET MEDICAL ASSISTANCE.

Section 5 - Fire Fighting Measures
BENZENE

Fire Fighting Procedures:
SELF-CONT BREATH APP,WATER FOG TO COOL EXPOSED CONTAINERS.
Unusual Fire or Explosion Hazard:
BURNS VIGOROUSLY AND EMITS ACID FUMES.

Extinguishing Media:
FOAM,CO*2,DRY CHEMICAL
Flash Point: Flash Point Text: 12F/-11C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1.3
Upper Limit(s): 7.9

Section 6 - Accidental Release Measures
BENZENE

Spill Release Procedures:
PROTECT FROM IGNITION. WEAR SELF CONTAINED BREATHING APPARATUS.

Section 7 - Handling and Storage
BENZENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
BENZENE

Repiratory Protection:
NIOSH/MSHA APPROVED RESP DEVICE IN ACCORD WITH EXPOSURE OF CONCERN.
Ventilation:
LOCAL/HIGH RATE MECHANICAL
Protective Gloves:
CHEMICAL TYPE
Eye Protection: GOGGLES/FACE MASK
Other Protective Equipment: AS REQUIRED TO PREVENT SKIN CONTACT.
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: MFR CONT: PHILLIPS PETROL CO MFR'S THE RAW MATERIAL,BURDICK & JACKSON LAB. REFINES IT TO DESIRED PCT,SPEC & GRADE. CONTAINER SIZE: 500 ML BOTTLE

Section 9 - Physical & Chemical Properties
BENZENE

HCC: F5
NRC/State License Number: N/A
Net Property Weight for Ammo: N/A
Boiling Point: Boiling Point Text: 176F/80C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: 100 **Vapor Density:** 2.77
Percent Volatile Organic Content:
Specific Gravity: 0.884
Volatile Organic Content Pounds per Gallon:
pH: N/P

Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: <1 (ETHYL ETHER)
Solubility in Water: NEGLIGIBLE
Appearance and Odor: COLORLESS LIQUID. AROMATIC HYDROCARBON ODOR
Percent Volatiles by Volume: 100
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
BENZENE

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDANTS
Stability Condition to Avoid:
N/P
Hazardous Decomposition Products:
N/P
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
BENZENE

Toxicological Information:
N/P

Section 12 - Ecological Information
BENZENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
BENZENE

Waste Disposal Methods:
BURN UNDER CONTROLLED CONDITIONS. COMPLY WITH LOCAL,STATE AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
BENZENE

Transport Information:
N/P

Section 15 - Regulatory Information
BENZENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:

Section 16 - Other Information
BENZENE

Other Information:
N/P

HMIS Transportation Information

Product Identification: BENZENE
Transporation ID Number: 95976
Responsible Party CAGE: BURDI
Date MSDS Prepared: 01/01/1985
Date MSDS Reviewed: 09/05/1986
MFN: 09/05/1986
Submitter: N TN
Status Code: C

Container Information
Unit of Issue:
Container Quantity:
Type of Container: BOTTLE,GLASS
Net Unit Weight:

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: BENZENE
DOT PSN Code: BRS
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN1114
DOT Packaging Group: II
Label: FLAMMABLE LIQUID
Special Provision(s): B101,T8
Packaging Exception: 150
Non Bulk Packaging: 202
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 L

Maximimum Quanity in Cargo Area: 60 L
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: BENZENE
IMO PSN Code: BXB
IMO PSN Modifier:
IMDG Page Number: 3185
UN Number: 1114
UN Hazard Class: 3.2
IMO Packaging Group: II
Subsidiary Risk Label: -
EMS Number: 3-03
Medical First Aid Guide Number: 312

IATA Detail Information

IATA Proper Shipping Name: BENZENE
IATA PSN Code: DBA
IATA PSN Modifier:
IATA UN Id Number: 1114
IATA UN Class: 3
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: FLAMMABLE LIQUID
Packaging Note for Passengers: 305
Maximum Quantity for Passengers: 5L
Packaging Note for Cargo: 307
Maximum Quantity for Cargo: 60L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: BENZENE
AFI Symbols:
AFI PSN Code: DBA
AFI PSN Modifier:
AFI UN Id Number: UN1114
AFI Hazard Class: 3
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: BENZENE
CAGE: BURDI
Assigned Individual: N
Company Name: BURDICK & JACKSON, INC.
Company PO Box:
Company Street Address1: 1953 S. HARVEY STREET
Company Street Address2: MUSKEGON, MI 49442 US
Health Emergency Telephone: 616-726-3171
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K

Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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CADMIUM

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Section 1 - Product and Company Identification
CADMIUM

Product Identification: CADMIUM
Date of MSDS: 05/23/1986 **Technical Review Date:** 09/09/1994
FSC: 6810 **NIIN:** **LIIN:** 00N052743
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: JOHNSON MATTHEY AESAR GROUP

Post Office Box: 1087
Manufacturer's Address1: 892 LAFAYETTE RD
Manufacturer's Address2: SEABROOK, NH 03874
Manufacturer's Country: US
General Information Telephone: 603-474-5511
Emergency Telephone: 603-474-5511;800-424-9300(CHEMTREC)
Emergency Telephone: 603-474-5511;800-424-9300(CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 1HA72
Special Project Code: N

Contractor Information

Contractor's Name: JOHNSON MATTHEY AESAR GROUP
Contractor's Address1: 892 LAFAYETTE RD
Contractor's Address2: SEABROOK, NH 03874
Contractor's Telephone: 603-474-5511
Contractor's CAGE: 1HA72

Section 2 - Compositon/Information on Ingredients
CADMIUM

Ingredient Name: CADMIUM; (CADMIUM DUSTS & SALTS) (SARA III)
Ingredient CAS Number: 7440-43-9 **Ingredient CAS Code:** M
RTECS Number: EU9800000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.2 MG/M3 DUST **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.01 MG/M3 DUST **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
CADMIUM

Health Hazards Acute & Chronic: INHALATION OF CADMIUM DUST & FUME CAN CAUSE

ACUTE POISONING, SYMPTOMS OF WHICH ARE USUALLY DELAYED FOR SEVERAL HOURS. CHRONIC EXPOSURE MAY CAUSE KIDNEY MALFUNCTION & PULMONARY FIBROSIS. IT HAS BEEN SU GGESTED THAT THERE IS AN ASSOCIATION BETWEEN EXPOSURE TO CADMIUM & CANCER OF THE PROSTATE.

Signs & Symptoms of Overexposure:
INHAL:MILD POIS CAUSES INCR SALAVATION, COUGH, SHORTNESS OF BREATH & GEN WEAK. SEV POIS CAUSES CHEST PAIN & SEV SHORTNESS OF BREATH DUE TO CONGESTION OF LUNGS. SKIN:THERE MAY BE RED RASH AT SITE OF CO NT. EYES:THERE MAY BE IRRIT & REDNESS. INGEST:MILD POIS CAUSES NAUS, VOMIT & DIARR. SEV POIS CAUSES HDCH, (SUPP DATA)

Medical Conditions Aggravated by Exposure:
NO DATA.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: YES

Carcinogenicity Explanation: CADMIUM:IARC MONOGRAPHS, SUPP, VOL 7, PG 139, 1987:GRP 2A. NTP 7TH ANNUAL RPT ON CARCINS, 1994:ANTIC TO BE (SUPP DATA)

Section 4 - First Aid Measures
CADMIUM

First Aid:
INHAL:REMOVE TO FRESH AIR, ALLOW TO REST & TRANSPORT TO HOSPITAL. SKIN:WASH W/SOAP & WATER. EYES:IRRIGATE W/WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION. INGEST:CALL MD IMMEDIATELY (FP N). RIN SE MOUTH, GIVE PLENTY OF WATER TO DRINK.

Section 5 - Fire Fighting Measures
CADMIUM

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
FINELY DIVIDED CADMIUM IS PYROPHORIC. IF CADMIUM METAL IS INVOLVED IN A FIRE, HIGHLY TOXIC CADMIUM OXIDE FUMES WILL BE EVOLVED.
Extinguishing Media:
SPECIAL POWDER FOR METAL FIRES, DRY SAND, BUT NOT HYDROUS EXTINGUISHING AGENTS.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A

Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
CADMIUM

Spill Release Procedures:
MASSIVE CADMIUM PRESENTS LITTLE HAZARD. POWDERED METAL SHOULD BE HANDLED AS TOXIC MATERIAL. AVOID MAKING & BREATHING DUSTS. WEAR PROTECTIVE CLOTHING, SWEEP UP & TRANSFER TO A SEALED CONTAINER.

Section 7 - Handling and Storage
CADMIUM

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
CADMIUM

Repiratory Protection:
FUME & DUST:NIOSH/MSHA APPROVED HIGH EFFICIENCY PARTICULATE RESPIRATOR OR SUPPLIED AIR RESPIRATOR W/FULL FACE PIECE.
Ventilation:
LOCAL EXHAUST: REQUIRED FOR DUST OR FUME.
Protective Gloves:
GENERAL LATEX TYPE GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: LAB COAT OR APRON.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EXPLAN OF CARCIN:CARCINOGEN. OSHA REGULATED, 29 CFR 1910.1027. HUMAN:LUNG, PROSTATE, RENAL SYSTEM EFFECTS. EFTS OF OVEREXP:MUSCULAR ACHES & ABDOMINAL PAIN.

Section 9 - Physical & Chemical Properties
CADMIUM

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 1409F,765C
Melting/Freezing Point: Melting/Freezing Text: 610F,321C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 8.64 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE

Solubility in Water: INSOLUBLE
Appearance and Odor: SILVER-WHITE BLUE-TINGED METAL.
Percent Volatiles by Volume: N/A
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
CADMIUM

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDIZERS, ELEMENTAL SULFUR, SELENIUM, TALLUNIUM.
Stability Condition to Avoid:
AVOID HEATING WHICH WILL LIBERATE METAL OXIDE FUME INTO BREATHING AREAS.
Hazardous Decomposition Products:
ACIDS LIBERATE HYDROGEN, NITRIC ACID LIBERATES NO*X, HEATING LIBERATES TOXIC CD/CDO FUMES.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
CADMIUM

Toxicological Information:
N/P

Section 12 - Ecological Information
CADMIUM

Ecological Information:
N/P

Section 13 - Disposal Considerations
CADMIUM

Waste Disposal Methods:
DISPOSE OF I/A/W FEDERAL, STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
CADMIUM

Transport Information:
N/P

Section 15 - Regulatory Information
CADMIUM

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information

CADMIUM

Other Information:
N/P

HAZCOM Label Information

Product Identification: CADMIUM
CAGE: 1HA72
Assigned Individual: N
Company Name: JOHNSON MATTHEY AESAR GROUP
Company PO Box:
Company Street Address1: 892 LAFAYETTE RD
Company Street Address2: SEABROOK, NH 03874 US
Health Emergency Telephone: 603-474-5511;800-424-9300(CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 09/09/1994
Status Code: C
Manufacturer's Label Number:
Date of Label: 09/09/1994
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

CHLOROFORM

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Section 1 - Product and Company Identification
CHLOROFORM

Product Identification: CHLOROFORM
Date of MSDS: 01/01/1987 **Technical Review Date:** 01/07/1993
FSC: 6520 **NIIN:** **LIIN:** 00F025941
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: SULTAN CHEMISTS INC

Post Office Box: N/K
Manufacturer's Address1: 85 WEST FOREST INC AVE
Manufacturer's Address2: ENGLEWOOD, NJ 07631
Manufacturer's Country: US
General Information Telephone: (201) 871-1232
Emergency Telephone: (201) 871-1232
Emergency Telephone: (201) 871-1232
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 63536
Special Project Code: N

Preparer Information

Preparer's Name: SULTAN CHEMISTS INC
Preparer's Address1: 85 W FOREST AVE
Preparer's Address2: ENGLEWOOD, NJ 07631-4001
Preparer's CAGE: 63536
Assigned Individual: N

Contractor Information

Contractor's Name: SULTAN CHEMISTS INC
Contractor's Address1: 85 W FOREST AVE
Contractor's Address2: ENGLEWOOD, NJ 07631-4001
Contractor's Telephone: 201-871-1232
Contractor's CAGE: 63536

Section 2 - Compositon/Information on Ingredients
CHLOROFORM

Ingredient Name: CHLOROFORM (TRICHLOROMETHANE) SUSPECTED CARCINOGEN BY NTP & IARC
Ingredient CAS Number: 67-66-3 **Ingredient CAS Code:** M
RTECS Number: FS9100000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: (C) 50 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 PPM; A2; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**

EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
CHLOROFORM

Health Hazards Acute & Chronic: INHALATION: NERVOUS SYSTEM DEPRESSION, DIZZINESS, & VERTIGO. SKIN: IRRITATION, DEFATTING, DERMATITIS. EYES: LOSS OF CORNEA EPITHELIUM, PAIN & IRRITATION. INGESTION: BURNING OF MOUTH & THROAT, PAIN IN CHEST & ABDOMEN, VOMITING, & SYSTEMIC EFFECTS.

Signs & Symptoms of Overexposure:
INHALATION: UNCONSCIOUSNESS & DEATH CAN RESULT. SKIN: ABSORPTION MAY CAUSE SYSTEMIC POISONING. INGESTION: VOMITING MAY CAUSE ASPIRATION INTO LUNGS WHICH CAN CAUSE CHEMICAL PNEUMONIA & SYSTEMIC EFFECTS .

Medical Conditions Aggravated by Exposure:
N/K

LD50 LC50 Mixture: N/K

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
CHLOROFORM

First Aid:
INHALATION: REMOVE TO FRESH AIR. IF BREATHING STOPS, ADMINISTER ARTIFICIAL RESPIRATION. EYES: FLUSH W/WATER FOR AT LEAST 15 MINS. SKIN: WASH W/PLENTY OF WATER FOR AT LEAST 15 MINS. INGESTION: DON'T IN DUCE VOMITING. NOTE TO PHYSICIAN: ADRENALIN SHOULD NEVER BE GIVEN TO PERSONS OVEREXPOSED TO CHLOROFORM. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
CHLOROFORM

Fire Fighting Procedures:
WEAR SELF-CONTAINED BREATHING APPARATUS IN POSTIVE PRESSURE MODE.
Unusual Fire or Explosion Hazard:
VAPORS ARE HEAVIER THAN AIR & WILL COLLECT IN LOW AREAS. UN 1888.
Extinguishing Media:
N/K

Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
CHLOROFORM

Spill Release Procedures:
EVACUATE AREA, VENTILATE. AVOID BREATHING VAPORS. WEAR PROTECTIVE EQUIPMENT. CLEAN UP BY MOPPING OR ABSORBENT MATERIAL, PLACE IN CLOSED CONTAINER FOR DISPOSAL. AVOID CONTAMINATION OF GROUND & SURFACE WATER. TURN OFF AIR CONDITIONING/HEAT SYSTEM.

Section 7 - Handling and Storage
CHLOROFORM

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
CHLOROFORM

Repiratory Protection:
IF VAPOR EXCEEDS OR IS LIKELY TO EXCEED 2 PPM USE NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS OR AIR LINE RESPIRATOR W/FULL FACE PIECE.
Ventilation:
TO MAINTAIN EXPOSURE LEVELS <2 PPM. DON'T USE IN CLOSED OR CONFINED SPACE. OPEN DOORS OR WINDOWS.
Protective Gloves:
SOLVENT RESISTANT SUCH AS VITON
Eye Protection: FACE SHIELD
Other Protective Equipment: POLY VINYL ALCOHOL GLOVES OR EQUIVALENT, SOLVENT RESISTANT BOOTS, APRON, HEAD GEAR, SAFETY SHOWER & EYEWASH STATION.
Work Hygenic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. DON'T EAT, DRINK OR SMOKE IN WORK AREA.
Supplemental Health & Safety Information: N/K

Section 9 - Physical & Chemical Properties
CHLOROFORM

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 139F
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 167 **Vapor Density:** 4.1
Percent Volatile Organic Content:

Specific Gravity: 1.48
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: 1.8 GM/100 ML
Appearance and Odor: CLEAR, COLORLESS LIQUID W/MILDLY SWEET ODOR
Percent Volatiles by Volume: 100%
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
CHLOROFORM

Stability Indicator: YES
Materials to Avoid:
STRONG ALKALIES, OXIDIZERS, ALKALI METALS, METALIC FINES OR POWDERS, ACETONE, ALUMINUM, DISILANE, OR MAGNESIUM
Stability Condition to Avoid:
OPEN FLAME, ELECTRIC ARCS, OR OTHER HOT SURFACES
Hazardous Decomposition Products:
TOXIC GASES, HYDROGEN CHLORIDE, PHOSGENE, & CHLORINE
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
CHLOROFORM

Toxicological Information:
N/P

Section 12 - Ecological Information
CHLOROFORM

Ecological Information:
N/P

Section 13 - Disposal Considerations
CHLOROFORM

Waste Disposal Methods:
CONTACT LICENSED RECLAIMER OR INCINERATION FACILITY. DISPOSE OF IN ACCORDANCE W/FEDERAL, STATE, & LOCAL REGULATIONS. UN 1888.

Section 14 - MSDS Transport Information
CHLOROFORM

Transport Information:
N/P

Section 15 - Regulatory Information
CHLOROFORM

SARA Title III Information:

N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
CHLOROFORM

Other Information:
N/P

HAZCOM Label Information

Product Identification: CHLOROFORM
CAGE: 63536
Assigned Individual: N
Company Name: SULTAN CHEMISTS INC
Company PO Box:
Company Street Address1: 85 W FOREST AVE
Company Street Address2: ENGLEWOOD, NJ 07631-4001 US
Health Emergency Telephone: (201) 871-1232
Label Required Indicator: Y
Date Label Reviewed: 01/07/1993
Status Code: C
Manufacturer's Label Number: N/R
Date of Label: 01/07/1993
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: None
Reactivity Hazard: Slight

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

F13 1,1-DICHLOROETHANE

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Section 1 - Product and Company Identification
F13 1,1-DICHLOROETHANE

Product Identification: F13 1,1-DICHLOROETHANE
Date of MSDS: 06/01/1989 **Technical Review Date:** 12/30/1994
FSC: 6550 **NIIN:** **LIIN:** 00F037545
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: CHEM SERVICE INC

Post Office Box: 3108
Manufacturer's Address1: 660 TOWER LN
Manufacturer's Address2: WEST CHESTER, PA 19381-3108
Manufacturer's Country: US
General Information Telephone: 215-692-3026/800-452-9994
Emergency Telephone: 215-692-3026/800-452-9994
Emergency Telephone: 215-692-3026/800-452-9994
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 84898
Special Project Code: N

Preparer Information

Preparer's Name: CHEM SERVICE INC
Post Office Box: 3108
Preparer's Address1: N/K
Preparer's Address2: WEST CHESTER, PA 19381
Preparer's CAGE: 84898
Assigned Individual: N

Contractor Information

Contractor's Name: CHEM SERVICE INC
Post Office Box: 3108
Contractor's Address1: N/K
Contractor's Address2: WEST CHESTER, PA 19381
Contractor's Telephone: 215-692-3026
Contractor's CAGE: 84898

Contractor Information

Contractor's Name: CHEM SERVICE, INC
Post Office Box: 599
Contractor's Address1: 660 TOWER LN
Contractor's Address2: WEST CHESTER, PA 19301-9650
Contractor's Telephone: 610-692-3026
Contractor's CAGE: 8Y898

Section 2 - Compositon/Information on Ingredients
F13 1,1-DICHLOROETHANE

Ingredient Name: 1,1-DICHLOROETHANE (ETHYLIDINE CHLORIDE)
Ingredient CAS Number: 75-34-3 **Ingredient CAS Code:** M
RTECS Number: KI0175000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:

% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: 200 PPM
OSHA PEL: 100 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 200 PPM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
F13 1,1-DICHLOROETHANE

Health Hazards Acute & Chronic: SKIN: RAPIDLY ABSORBED/HARMFUL/IRRITATION/ALLERGIC REACTION/SENSITIZATION. INHALATION: HARMFUL/RESPIRATORY TRACT IRRITATION/MUCOUS MEMBRANE IRRITATION. INGESTION: HARMFUL. EYES: IRRITATION. EXPOSURE C AN CAUSE LIVER/KIDNEY/NERVOUS SYSTEM INJURY, DELAYED ADVERSE HEALTH AFFECTS. NARCOTIC AT HIGH CONCENTRATIONS.

Signs & Symptoms of Overexposure:
IRRITATION, DISORIENTATION.

Medical Conditions Aggravated by Exposure:
N/K

LD50 LC50 Mixture: ORAL LD50 (RAT/MOUSE): 725 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
F13 1,1-DICHLOROETHANE

First Aid:
EYES: FLUSH W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET. INGESTION: DO N'T INDUCE VOMITING/GIVE LIQUIDS IF UNCONSCIOUS/CONVULSIVE. IF VOMITING, WATCH

CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
F13 1,1-DICHLOROETHANE

Fire Fighting Procedures:
N/K
Unusual Fire or Explosion Hazard:
FLAMMABLE CHEMICAL.
Extinguishing Media:
CO2, DRY CHEMICAL POWDER. DON'T USE WATER.
Flash Point: Flash Point Text: 23F

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 6
Upper Limit(s): 16

Section 6 - Accidental Release Measures
F13 1,1-DICHLOROETHANE

Spill Release Procedures:
EVACUATE AREA. WEAR APPRORPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFAC ES TO REMOVE ANY RESIDUES.

Section 7 - Handling and Storage
F13 1,1-DICHLOROETHANE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
F13 1,1-DICHLOROETHANE

Repiratory Protection:
WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation:
CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Protective Gloves:
N/K
Eye Protection: EYE SHIELDS
Other Protective Equipment: N/K
Work Hygenic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. READILY ABSORBED & RETAINED ON CLOTHING &/SHOES.
Supplemental Health & Safety Information: N/K

Section 9 - Physical & Chemical Properties
F13 1,1-DICHLOROETHANE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 135.14F
Melting/Freezing Point: Melting/Freezing Text: -142.6F
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 182 **Vapor Density:** 3.4
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: SLIGHT
Appearance and Odor: COLORLESS LIQUID W/FRUITY/PLEASANT ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
F13 1,1-DICHLOROETHANE

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDIZING AGENTS/BASES, CAUSTICS.
Stability Condition to Avoid:
SENSITIVE TO HEAT.
Hazardous Decomposition Products:
TOXIC FUMES.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
F13 1,1-DICHLOROETHANE

Toxicological Information:
N/P

Section 12 - Ecological Information
F13 1,1-DICHLOROETHANE

Ecological Information:
N/P

Section 13 - Disposal Considerations
F13 1,1-DICHLOROETHANE

Waste Disposal Methods:
BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
F13 1,1-DICHLOROETHANE

Transport Information:
N/P

Section 15 - Regulatory Information
F13 1,1-DICHLOROETHANE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
F13 1,1-DICHLOROETHANE

Other Information:
N/P

HAZCOM Label Information

Product Identification: F13 1,1-DICHLOROETHANE
CAGE: 84898
Assigned Individual: N
Company Name: CHEM SERVICE INC
Company PO Box: 3108
Company Street Address1: N/K
Company Street Address2: WEST CHESTER, PA 19381 US
Health Emergency Telephone: 215-692-3026/800-452-9994
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

1,2-DICHLOROETHANE

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Section 1 - Product and Company Identification
1,2-DICHLOROETHANE

Product Identification: 1,2-DICHLOROETHANE
Date of MSDS: 04/22/1989 **Technical Review Date:** 06/06/1999
FSC: 6810 **NIIN:** 00-838-5932
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: FISHER SCIENTIFIC CHEMICAL DIVISION

Manufacturer's Address1: 1 REAGENT LANE
Manufacturer's Address2: FAIR LAWN, NJ 07410
Manufacturer's Country: NK
General Information Telephone: 201-796-7100
Emergency Telephone: 201-796-7523
Emergency Telephone: 201-796-7523
MSDS Preparer's Name: GASTON L. PILLORI
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 1B464
Special Project Code: N

Item Description

Item Name: DICHLOROETHANE,REAGENT
Item Manager: S9G
Specification Number: O-C-265C
Type/Grade/Class: NONE
Unit of Issue: GL
Unit of Issue Quantity: 4
Type of Container: BOTTLE

Contractor Information

Contractor's Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Contractor's Address1: 1 REAGENT LANE
Contractor's Address2: FAIR LAWN, NJ 07410-2802
Contractor's Telephone: 201-796-7100
Contractor's CAGE: 1B464

Section 2 - Compositon/Information on Ingredients
1,2-DICHLOROETHANE

Ingredient Name: ETHYLENE DICHLORIDE (SARA III)
Ingredient CAS Number: 107-06-2 **Ingredient CAS Code:** M
RTECS Number: KI0525000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: NOT ESTABLISHED
OSHA PEL: 50 PPM/C,100PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 PPM; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**

EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
1,2-DICHLOROETHANE

Health Hazards Acute & Chronic: ACUTE: INHALE- IRRITATION OF UPPER RESPIRATORY TRACT, HEADACE, NAUSEA, VOMITING. SKIN- IRRITATION, CYANOSIS, HYPOTENSION, DIZZINESS. EYE- DISCOMFORT, CORNEAL INJURY. INGEST- HYPOTENSION, CYANOSIS, NAU SEA. CHRONIC: INHALE- NEUROLOGICAL CHANGES, LIVER AND KIDNEY DAMAGE. SKIN- SEVERE IRRITATION. EYE- CONJUNCTIVITIS.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS AND MSDS. ETHYLENE DICHLORIDE IS AN EYE, SKIN, AND MUCOUS MEMBRANE IRRITANT AND A CENTRAL NERVOUS SYSTEM DEPRESSANT. POISONING MAY AFFECT THE LIVER, KIDNEYS, HEART ,AND ADRENAL GLAN DS. THE USE OF ALCOHOLIC BEVERAGES MAY ENHANCE THE TOXIC EFFECTS.

Medical Conditions Aggravated by Exposure:
PERSONS WITH A HISTORY OF SKIN AND RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.

LD50 LC50 Mixture: LD50 (ORAL RAT) IS 670 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: NO

Carcinogenicity Explanation: NONE OF THE CHEMICALS IN THIS PRODUCT IS LISTED BY OSHA AS A CARCINOGEN.

Section 4 - First Aid Measures
1,2-DICHLOROETHANE

First Aid:
INHALATION: REMOVE SUBJECT TO FRESH AIR. IF BREATHING STOPPED, GIVE ARTIFICIAL RESPIRATION. EYE: FLUSH WITH PLENTY OF WATER FOR 15 MINUTES. GET IMMEDIATE MEDICAL ATTENTION. SKIN: WASH WITH SOAP AND WA TER. REMOVE CONTAMINATED CLOTHING. INGESTION: GET IMMEDIATE MEDICAL ATTENTION. IF MEDICAL ATTENTION IS NOT AVAILABLE, INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT.

Section 5 - Fire Fighting Measures
1,2-DICHLOROETHANE

Fire Fighting Procedures:

FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.

Unusual Fire or Explosion Hazard:
CONTAINERS MAY BURST WHEN EXPOSED TO HEAT OF FIRE.

Extinguishing Media:
DRY CHEMICAL, CARBON DIOXIDE, HALON, WATER SPRAY OR STANDARD FOAM

Flash Point: Flash Point Text: 56.0F,13.3C

Autoignition Temperature:
Autoignition Temperature Text: 775F
Lower Limit(s): 6.2
Upper Limit(s): 16.0

Section 6 - Accidental Release Measures
1,2-DICHLOROETHANE

Spill Release Procedures:
SOAK UP SMALL SPILLS WITH SAND OR INERT ABSORBANT AND PLACE IN CONTAINERS FOR LATER DISPOSAL. DIKE TO RETAIN LARGE SPILLS. VACUUM UP FREE LIQUID. REMOVE RESIDUE WITH INERT ABSORBANT. PLACE IN DISPOSAL CONTAINER. FLUSH AREA WITH WATER.

Section 7 - Handling and Storage
1,2-DICHLOROETHANE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
1,2-DICHLOROETHANE

Repiratory Protection:
IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL (TLV), USE NIOSH/MSHA APPROVED RESPIRATOR AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION.

Ventilation:
MECHANICAL (GENERAL) VENTILATION IS REQUIRED. LOCAL EXHAUST MAY BE REQUIRED IF WORK AREA IS NOT VENTED.

Protective Gloves:
RUBBER

Eye Protection: CHEMICAL SAFETY GOGGLES

Other Protective Equipment: SAFETY SHOWER AND EYE BATH. OTHER EQUIPMENT AS REQUIRED TO MINIMIZE EXPOSURE FROM PROLONGED OR REPEATED CONTACT.

Work Hygenic Practices: WASH THROUGHLY AFTER HANDLING AND BEFORE EATING. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

Supplemental Health & Safety Information: CONTACT LENSES SHOULD NOT BE WORN WHEN HANDLING THIS SUBSTANCE.

Section 9 - Physical & Chemical Properties
1,2-DICHLOROETHANE

HCC: F2
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: =83.9C, 183.F **Boiling Point Text:**
Melting/Freezing Point: =-35.6C, -32.F **Melting/Freezing Text:**
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: 87 **Vapor Density:** 3.35
Percent Volatile Organic Content:
Specific Gravity: 1.256
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 1.3 (CARBON TETRACHLO=1)
Solubility in Water: 0.8%
Appearance and Odor: CLEAR, COLORLESS, OILY LIQUID W/ PLEASANT CLOROFORM-LIKE ODOR AND SWEET TASTE.
Percent Volatiles by Volume: N/P
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
1,2-DICHLOROETHANE

Stability Indicator: YES
Materials to Avoid:
ALUMINUM, AMMONIA, CAUSTICS, DIMETHYLAMINOPROPYAMINE, DINITROGEN TETROXIDE, NITRIC ACID, OXIDIZERS, POTASSIUM.
Stability Condition to Avoid:
ABNORMAL TEMPERATURES AND PRESSURES.
Hazardous Decomposition Products:
HIGHLY TOXIC FUMES OF PHOSGENE, TOXIC AND CORROSIVE FUMES OF CHLORIDES, AND OXIDES OF CARBON.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
1,2-DICHLOROETHANE

Toxicological Information:
N/P

Section 12 - Ecological Information
1,2-DICHLOROETHANE

Ecological Information:
N/P

Section 13 - Disposal Considerations
1,2-DICHLOROETHANE

Waste Disposal Methods:
DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL

LAWS AND REGULATIONS.

Section 14 - MSDS Transport Information
1,2-DICHLOROETHANE

Transport Information:
N/P

Section 15 - Regulatory Information
1,2-DICHLOROETHANE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
1,2-DICHLOROETHANE

Other Information:
N/P

HMIS Transportation Information

Product Identification: 1,2-DICHLOROETHANE
Transporation ID Number: 88093
Responsible Party CAGE: 1B464
Date MSDS Prepared: 04/22/1989
Date MSDS Reviewed: 12/04/1989
MFN: 12/04/1989
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** GL
- **Container Quantity:** 4
- **Type of Container:** BOTTLE
- **Net Unit Weight:** 10.48 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: ETHYLENE DICHLORIDE
DOT PSN Code: GAP
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN1184
DOT Packaging Group: II
Label: FLAMMABLE LIQUID, POISON
Special Provision(s): T14
Packaging Exception: NONE
Non Bulk Packaging: 202
Bulk Packaging: 243
Maximimum Quanity in Passenger Area: 1 L
Maximimum Quanity in Cargo Area: 60 L
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: ETHYLENE DICHLORIDE
IMO PSN Code: GVF
IMO PSN Modifier:
IMDG Page Number: 3224
UN Number: 1184
UN Hazard Class: 3.2
IMO Packaging Group: II
Subsidiary Risk Label: TOXIC
EMS Number: 3-03
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: ETHYLENE DICHLORIDE
IATA PSN Code: LIA
IATA PSN Modifier:
IATA UN Id Number: 1184
IATA UN Class: 3
Subsidiary Risk Class: 6.1
UN Packaging Group: II
IATA Label: FLAMMABLE LIQUID & TOXIC
Packaging Note for Passengers: 306
Maximum Quantity for Passengers: 1L
Packaging Note for Cargo: 308
Maximum Quantity for Cargo: 60L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: ETHYLENE DICHLORIDE
AFI Symbols:
AFI PSN Code: LIA
AFI PSN Modifier:
AFI UN Id Number: UN1184
AFI Hazard Class: 3
AFI Packing Group: II
AFI Label: 6.1
Special Provisions: P4

Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: 1,2-DICHLOROETHANE
CAGE: 1B464
Assigned Individual: N
Company Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Company PO Box:
Company Street Address1: 1 REAGENT LANE
Company Street Address2: FAIR LAWN, NJ 07410-2802 US
Health Emergency Telephone: 201-796-7100 OR 201-796-7523
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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F29 1,1-DICHLOROETHENE

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Section 1 - Product and Company Identification
F29 1,1-DICHLOROETHENE

Product Identification: F29 1,1-DICHLOROETHENE
Date of MSDS: 01/26/1995 **Technical Review Date:** 04/10/1996
FSC: 6550 **NIIN:** **LIIN:** 00F037520
Submitter: F BT
Status Code: C
MFN: 02
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: CHEM SERVICE INC

Post Office Box: 3108
Manufacturer's Address1: 660 TOWER LN
Manufacturer's Address2: WEST CHESTER, PA 19381-3108
Manufacturer's Country: US
General Information Telephone: 215-692-3026/800-452-9994
Emergency Telephone: 215-386-2100/215-692-3026
Emergency Telephone: 215-386-2100/215-692-3026
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 84898
Special Project Code: N

Preparer Information

Preparer's Name: CHEM SERVICE INC
Post Office Box: 3108
Preparer's Address1: N/K
Preparer's Address2: WEST CHESTER, PA 19381
Preparer's CAGE: 84898
Assigned Individual: N

Contractor Information

Contractor's Name: CHEM SERVICE INC
Post Office Box: 3108
Contractor's Address1: N/K
Contractor's Address2: WEST CHESTER, PA 19381
Contractor's Telephone: 215-692-3026
Contractor's CAGE: 84898

Contractor Information

Contractor's Name: CHEM SERVICE, INC
Post Office Box: 599
Contractor's Address1: 660 TOWER LN
Contractor's Address2: WEST CHESTER, PA 19301-9650
Contractor's Telephone: 610-692-3026
Contractor's CAGE: 8Y898

Section 2 - Compositon/Information on Ingredients
F29 1,1-DICHLOROETHENE

Ingredient Name: VINYLIDENE CHLORIDE, 1,1-DICHLOROETHENE, 1,1-DICHLOROETHYLENE, VDC
Ingredient CAS Number: 75-35-4 **Ingredient CAS Code:** M
RTECS Number: KV9275000 **RTECS Code:** M
=WT: **=WT Code:**
=Volume: **=Volume Code:**
>WT: **>WT Code:**
>Volume: **>Volume Code:**
<WT: **<WT Code:**

<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: 5 PPM
OSHA PEL: N/K **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 20 MG/CUM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
F29 1,1-DICHLOROETHENE

Health Hazards Acute & Chronic: SKIN: IRRITATION & SENSITIZATION, CAN CAUSE AN ALLERGIC SKIN REACTION. INHALATION: CAN BE IRRITATING TO MUCOUS MEMBRANES. NARCOTIC AT HIGH CONCENTRATIONS, EXPOSURE CAN CAUSE LIVER & KIDNEY DAMAGE, NER VOUS SYSTEM INJURY & CARDIOVASCULAR SYSTEM INJURY. CAN CAUSE DELAYED ADVERSE HEALTH EFFECTS.

Signs & Symptoms of Overexposure:
IRRITATION.

Medical Conditions Aggravated by Exposure:
N/K

LD50 LC50 Mixture: ORAL LD50(RAT/MOUSE): 200 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
F29 1,1-DICHLOROETHENE

First Aid:
EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURED-USE SOAP & WATER TO CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN/MOUTH TO MOUTH I F NEEDED. CONTINUE LIFE SUPPORTING MEASURES UNTIL MEDICAL ASSISTANCE HAS ARRIVED.

KEEP WARM & QUIET. INGESTION: DON'T GIVE LIQUIDS/INDUCE VOMITING TO AN UNCONSCIOUS/CONVULSING PERSON. (SEE SUPP)

Section 5 - Fire Fighting Measures
F29 1,1-DICHLOROETHENE

Fire Fighting Procedures:
N/K
Unusual Fire or Explosion Hazard:
FLAMMABLE CHEMICAL.
Extinguishing Media:
CO2, DRY CHEMICAL POWDER. DON'T USE WATER!
Flash Point: Flash Point Text: 5F

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 6.5
Upper Limit(s): 15.5

Section 6 - Accidental Release Measures
F29 1,1-DICHLOROETHENE

Spill Release Procedures:
EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SUR FACES TO REMOVE ANY RESIDUES.

Section 7 - Handling and Storage
F29 1,1-DICHLOROETHENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
F29 1,1-DICHLOROETHENE

Repiratory Protection:
USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation:
CHEMICAL HOOD.
Protective Gloves:
N/K
Eye Protection: GLASS SHIELDS
Other Protective Equipment: N/K
Work Hygenic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
Supplemental Health & Safety Information: IF PATIENT IS VOMITING-WATCH CLOSELY TO MAKE SURE AIRWAY DOESN'T BECOME OBSTRUCTED BY VOMIT. OBTAIN MEDICAL ATTENTION IN ALL CASES. AN ANTIDOTE IS A SUBSTANCE INTENDED TO COUNTERACT THE EFFECT OF A PO ISON. IT SHOULD BE GIVEN ONLY BY A PHYSICIAN/TRAINED EMERGENCY PERSONNEL. GET MEDICAL ADVICE FROM POISON CONTROL CENTER.

Section 9 - Physical & Chemical Properties
F29 1,1-DICHLOROETHENE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 89.06F
Melting/Freezing Point: Melting/Freezing Text: -188.5F
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 500 **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: SLIGHT
Appearance and Odor: COLORLESS LIQUID W/FRUITY/PLEASANT ODOR
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
F29 1,1-DICHLOROETHENE

Stability Indicator: YES
Materials to Avoid:
INCOMPATIBLE MATERIALS
Stability Condition to Avoid:
HEAT, AIR, PRESSURE.
Hazardous Decomposition Products:
N/K
Hazardous Polymerization Indicator: YES
Conditions to Avoid Polymerization:
MAY POLYMERIZE UPON STANDING.

Section 11 - Toxicological Information
F29 1,1-DICHLOROETHENE

Toxicological Information:
N/P

Section 12 - Ecological Information
F29 1,1-DICHLOROETHENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
F29 1,1-DICHLOROETHENE

Waste Disposal Methods:
BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
F29 1,1-DICHLOROETHENE

Transport Information:
N/P

Section 15 - Regulatory Information
F29 1,1-DICHLOROETHENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
F29 1,1-DICHLOROETHENE

Other Information:
N/P

HAZCOM Label Information

Product Identification: F29 1,1-DICHLOROETHENE
CAGE: 84898
Assigned Individual: N
Company Name: CHEM SERVICE INC
Company PO Box: 3108
Company Street Address1: N/K
Company Street Address2: WEST CHESTER, PA 19381 US
Health Emergency Telephone: 215-386-2100/215-692-3026
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

LEAD

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Section 1 - Product and Company Identification
LEAD

Product Identification: LEAD
Date of MSDS: 08/03/1989 **Technical Review Date:** 04/15/1998
FSC: 3439 **NIIN:** **LIIN:** 00N084991
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: BELMONT METALS INC

Manufacturer's Address1: 330 BELMONT AVE
Manufacturer's Address2: BROOKLYN, NY 11207
Manufacturer's Country: US
General Information Telephone: 718-342-4900
Emergency Telephone: 718-342-4900
Emergency Telephone: 718-342-4900
MSDS Preparer's Name: BRUCE N REED
Proprietary: N
Reviewed: N
Published: Y
CAGE: 70774
Special Project Code: N

Contractor Information

Contractor's Name: BELMONT METALS INC
Contractor's Address1: 330 BELMONT AVE
Contractor's Address2: BROOKLYN, NY 11207
Contractor's Telephone: 718-342-4900
Contractor's CAGE: 70774

Section 2 - Compositon/Information on Ingredients
LEAD

Ingredient Name: LEAD (SARA 313) (CERCLA)
Ingredient CAS Number: 7439-92-1 **Ingredient CAS Code:** M
RTECS Number: OF7525000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 99.99
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: SEE 1910.1025 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.15 MG/M3 DUST **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
LEAD

Health Hazards Acute & Chronic: ACUTE: INHAL: LEAD INTOXICATION MAY RESULT FROM CHRONIC HIGH LEAD EXPOSURES W/SYMPS OF ANEMIA, INSOMNIA, WEAK,

CONSTIPATION & GI DISORDER. INGESTION OF LEAD MAY CAUSE LEAD INTOXICATION W/ACCOMPANYING SYMPS OF NAUS & ABDOM PAIN. EYE: MECH IRRIT. SKIN: POSS MECH IRRIT OF SKIN. SIGNS & SYMPS ASSOC W/EXPOS(EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ: OVER TLV: DISEASES OF BLOOD & BLOOD FORMING ORGANS, KIDNEYS, NERV & POSSIBLY REPRODUCTIVE SYSTEMS. LEAD APPEARS ON THE NAVY LISTING OF OCCUP CHEM REPROD HAZARDS. SEEK CONSULTATION FROM APPRO P HLTH PROFESSIONALS CONCERNING LATEST HAZARD LIST INFO & SAFE HNDLG & EXPOS INFO (FP N).

Medical Conditions Aggravated by Exposure:
NOT APPLICABLE.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
LEAD

First Aid:
INHAL: REMOVE FROM EXPOSURE. GET IMMEDIATE MEDICAL ATTENTION. INGEST: GET IMMEDIATE MEDICAL ATTENTION. EYE CONT: FLUSH WITH COPIOUS QUANTITIES OF WATER FOR @ LST 15 MINS. GET IMMEDIATE MEDICAL ATTENTI ON. SKIN CONT: WASH THOROUGHLY WITH SOAP AND WATER.

Section 5 - Fire Fighting Measures
LEAD

Fire Fighting Procedures:
WEAR NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
MOLTEN METALS PRODUCE FUME, VAPOR AND/OR DUST THAT MAY BE TOXIC AND OR RESPIRATORY IRRITANTS. WILL REACT WITH STRONG OXIDIZERS.
Extinguishing Media:
CHEMICAL OR CARBON DIOXIDE SHOULD BE USED ON SURROUNDING FIRE. DO NOT USE WATER ON FIRES WHERE MOLTEN METAL IS PRESENT.
Flash Point: Flash Point Text: NON FLAMMABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
LEAD

Spill Release Procedures:
DUST MATERIAL SHOULD BE VACUUMED OR WET SWEPT WHERE VACUUMING IS NOT FEASIBLE. PARTICULATE MATTER SHOULD BE STORED IN DRY CONTAINERS FOR LATER DISPOSAL. DO NOT USE COMPRESSED AIR OR DRY SWEEPING AS A MEANS OF CLEANING.

Section 7 - Handling and Storage
LEAD

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
LEAD

Repiratory Protection:
NIOSH APPROVED RESPIRATOR.
Ventilation:
NONE SPECIFIED BY MANUFACTURER.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPRVD EYE WASH & DELUGE SHOWER (FP N).
COVERALLS OR FULL BODY CLOTHING SHOULD BE WORN DURING PROD & USE (SUPDAT)
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: OTHER PROT EQUIP: AND PROPERLY LAUNDERED AFTER USE.

Section 9 - Physical & Chemical Properties
LEAD

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: 631F,333C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 11.34
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: INSOLUBLE
Appearance and Odor: SILVERY GRAY METALLIC. NO ODOR.

Percent Volatiles by Volume: N/A
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
LEAD

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDZERS AND THIS PRODUCT MAY LIBERATE HYDROGEN GAS.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
HIGH TEMPERATURES MAY PRODUCE HEAVY METAL FUME, VAPOR AND OR DUST.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
LEAD

Toxicological Information:
N/P

Section 12 - Ecological Information
LEAD

Ecological Information:
N/P

Section 13 - Disposal Considerations
LEAD

Waste Disposal Methods:
DISPOSE OF TOXIC SUBSTANCES IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGUALTIONS.

Section 14 - MSDS Transport Information
LEAD

Transport Information:
N/P

Section 15 - Regulatory Information
LEAD

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
LEAD

LEAD

Other Information:
N/P

HAZCOM Label Information

Product Identification: LEAD
CAGE: 70774
Assigned Individual: N
Company Name: BELMONT METALS INC
Company PO Box:
Company Street Address1: 330 BELMONT AVE
Company Street Address2: BROOKLYN, NY 11207 NK
Health Emergency Telephone: 718-342-4900
Label Required Indicator: Y
Date Label Reviewed: 04/15/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 04/15/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

METHYLENE CHLORIDE

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Section 1 - Product and Company Identification
METHYLENE CHLORIDE

Product Identification: METHYLENE CHLORIDE
Date of MSDS: 06/28/1988 **Technical Review Date:** 04/16/1998
FSC: 6810 **NIIN:** 00-616-9188
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: BAKER J T CHEMICAL CO

Manufacturer's Address1: 222 RED SCHOOL LANE
Manufacturer's Address2: PHILLIPSBURG, NJ 08865-2219
Manufacturer's Country: US
General Information Telephone: 201 859 2151
Emergency Telephone: 201 859 2151
Emergency Telephone: 201 859 2151
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: LO457
Special Project Code: N

Item Description

Item Name: DICHLOROMETHANE,TECHNICAL
Item Manager: S9G
Specification Number: MIL-D-6998
Type/Grade/Class: NONE
Unit of Issue: DR **Quantitative Expression:** 00000000055GL
Unit of Issue Quantity: 1
Type of Container: DRUM

Contractor Information

Contractor's Name: BAKER J T CHEMICAL CO
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865-2219
Contractor's Telephone: 201 859 2151
Contractor's CAGE: LO457

Contractor Information

Contractor's Name: MALLINCKRODT BAKER, INC. (FORMERLY J.T. BAKER INC)
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865-2219
Contractor's Telephone: 800-582-2537
Contractor's CAGE: 70829

Section 2 - Compositon/Information on Ingredients
METHYLENE CHLORIDE

Ingredient Name: METHYLENE CHLORIDE (SARA III)
Ingredient CAS Number: 75-09-2 **Ingredient CAS Code:** M
RTECS Number: PA8050000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:

% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: >98
% Enviromental Weight:
Other REC Limits: N/R
OSHA PEL: 500 PPM/C,1000; Z2 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM, A2; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
METHYLENE CHLORIDE

Health Hazards Acute & Chronic: INHALATION & INGESTION ARE HARMFUL & MAY BE FATAL. OVEREXPOSURE TO THIS PRODUCT CAN PRODUCE ELEVATED CARHOXYHEMOGLOBIN LEVELS IN THE BLOOD. CONTACT WITH SKIN ORT IN TEMPORARY CORNEAL DAMAGE. CHRONIC E FF:KIDNEY,LIVER,LUNG,BLOOD

Signs & Symptoms of Overexposure:
INHALE:HEADACHE,NAUSEA,VOMITING,NARCOSIS, WEAKNESS,FATIQUE,DIZZINESS,IRRITATION OF RESPIRATORY TRACT,NUMBNESS OF EXTRENITIES,CENTRAL NERVOUS SYSTEM DEPRESSION,PURVOUS SYSTEM DEPRESSION, GASTROINTESTIN AL IRRITATION, & UNCONSCIOUS

Medical Conditions Aggravated by Exposure:
NESS.

LD50 LC50 Mixture: LD50 ORAL RAT=2136 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: YES
OSHA: NO

Carcinogenicity Explanation: METHYLENE CHLORIDE IS LISTED AS POSSIBLE CARCINOGENIC TO HUMAN BY IARC.

Section 4 - First Aid Measures
METHYLENE CHLORIDE

First Aid:
INHALE:REMOVE TO FRESH AIR, IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN; IN CASE OF CONTACT, FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES W HING BEFORE REUSE; INGEST: DO NOT INDUCE VOMITING, SEE A PHYSICIAN.

Section 5 - Fire Fighting Measures
METHYLENE CHLORIDE

Fire Fighting Procedures:
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.
Unusual Fire or Explosion Hazard:
USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK.
Extinguishing Media:
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/K
Lower Limit(s): N/R
Upper Limit(s): N/R

Section 6 - Accidental Release Measures
METHYLENE CHLORIDE

Spill Release Procedures:
ELIMINATE IGNITION SOURCES. VENTILATE AREA. USE NON-SPARKING TOOLS.STOP LEAK.ABS0RB IN INERT ABSORBENT & PLACE INTO APPROPIATE DISPOSAL CONTAINER & SEAL. FLUSH AREA WITH WATER.

Section 7 - Handling and Storage
METHYLENE CHLORIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
METHYLENE CHLORIDE

Repiratory Protection:
USE SELF-CONTAINED BREATHING APPARATUS IF AIRBORNE CONCENTRATION EXCEEDS TLV.
Ventilation:
SUFFICIENT MECHANICAL (GENERAL) AND/OR LOCAL EXHAUST VENTILATION TO MAINTAIN EXPOSURE BELOW TLV.
Protective Gloves:
POLYVINYL
Eye Protection: SAFETY GOGGLES & FACE SHIELD.
Other Protective Equipment: FULL WORK CLOTHING TO PREVENT REPEATED OR PROLONGED SKIN CONTACT. EYE WASH STATION AND SAFETY SHOWER.
Work Hygenic Practices: AVOID CONTACT WITH EYES & SKIN.DO NOT BREATHE VAPORS.WASH THOROUGHLY AFTER HANDLING.LAUNDER CONTAMINATED CLOTHING.

Supplemental Health & Safety Information: N/P

Section 9 - Physical & Chemical Properties
METHYLENE CHLORIDE

HCC: T4
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: 104F/40C
Melting/Freezing Point: Melting/Freezing Text: -139F/-95C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 350 **Vapor Density:** 2.9
Percent Volatile Organic Content:
Specific Gravity: 1.32
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/K
Evaporation Weight and Reference: 27.5 (BU AC =1)
Solubility in Water: MODERATE(1-10 %)
Appearance and Odor: CLEAR,COLORLESS LIQUID. PENETRATING ETHER-LIKE ODOR.
Percent Volatiles by Volume: 100
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
METHYLENE CHLORIDE

Stability Indicator: YES
Materials to Avoid:
ALKALI METALS,STRONG OXIDIZING AGENTS,STRONG BASES, OXIDES OF NITROGEN,ZINC,ALUMINUM,WATER,MAGNESIUM,AMINES,RUBBER,ETC.
Stability Condition to Avoid:
HEAT, FLAME, OTHER SOURCES OF IGNITION, MOISTURE, LIGHT.
Hazardous Decomposition Products:
HYDROGEN CHLORIDE,PHOSGENE,CHLORINE,CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/R

Section 11 - Toxicological Information
METHYLENE CHLORIDE

Toxicological Information:
N/P

Section 12 - Ecological Information
METHYLENE CHLORIDE

Ecological Information:
N/P

Section 13 - Disposal Considerations
METHYLENE CHLORIDE

Waste Disposal Methods:

DISPOSAL.DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

Section 14 - MSDS Transport Information
METHYLENE CHLORIDE

Transport Information:
N/P

Section 15 - Regulatory Information
METHYLENE CHLORIDE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
METHYLENE CHLORIDE

Other Information:
N/P

HMIS Transportation Information

Product Identification: METHYLENE CHLORIDE
Transporation ID Number: 79908
Responsible Party CAGE: LO457
Date MSDS Prepared: 06/28/1988
Date MSDS Reviewed: 04/16/1998
MFN: 04/16/1998
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** DR
- **Container Quantity:** 1
- **Type of Container:** DRUM
- **Net Unit Weight:** 605 LBS.

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity: N/R
Form:
Net Explosive Weight: N/R
Coast Guard Ammunition Code: N/R
Magnetism: N/P
AF MMAC Code: NR
DOD Exemption Number: N/R
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y

Additional Data:
CARGO AIR ONLY.RQ FOR METHYLENE CHLORIDE IS 1000 LBS.

Department of Transportation Information

DOT Proper Shipping Name: DICHLOROMETHANE
DOT PSN Code: EUP
Symbols:
DOT PSN Modifier:
Hazard Class: 6.1
UN ID Number: UN1593
DOT Packaging Group: III
Label: KEEP AWAY FROM FOOD
Special Provision(s): N36,T13
Packaging Exception: 153
Non Bulk Packaging: 203
Bulk Packaging: 241
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: DICHLOROMETHANE
IMO PSN Code: FLF
IMO PSN Modifier:
IMDG Page Number: 6127
UN Number: 1593
UN Hazard Class: 6.1
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 6.1-02
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: DICHLOROMETHANE
IATA PSN Code: IYW
IATA PSN Modifier:
IATA UN Id Number: 1593
IATA UN Class: 6.1
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: TOXIC
Packaging Note for Passengers: 605
Maximum Quantity for Passengers: 60L
Packaging Note for Cargo: 612
Maximum Quantity for Cargo: 220L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: DICHLOROMETHANE
AFI Symbols:
AFI PSN Code: IYW
AFI PSN Modifier:
AFI UN Id Number: UN1593
AFI Hazard Class: 6.1
AFI Packing Group: III
AFI Label:

Special Provisions: P5, N36
Back Pack Reference: A10.5

HAZCOM Label Information

Product Identification: METHYLENE CHLORIDE
CAGE: LO457
Assigned Individual: Y
Company Name: BAKER J T CHEMICAL CO
Company PO Box:
Company Street Address1: 222 RED SCHOOL LANE
Company Street Address2: PHILLIPSBURG, NJ 08865-2219 US
Health Emergency Telephone: 201-859-2151
Label Required Indicator: Y
Date Label Reviewed: 04/16/1998
Status Code: C
Manufacturer's Label Number: UNKNOWN
Date of Label: 04/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Slight
Reactivity Hazard: Slight

8/7/2002 11:45:33 PM

MATERIALS & SUPPLY CORP.

	DEGREE OF HAZARD	HAZARD RATINGS
NFPA HAZARD IDENTIFICATION	HEALTH: 0 FIRE: 0 REACTIVITY: 0	0= LEAST 1= SLIGHT 2= MODERATE 3= HIGH 4= EXTREME

SECTION 1	COMPONENT DATA
PRODUCT NAME:	LVOC-1/PCE
COMMON NAME	BLENDED PETROLEUM HYDROCARBON
CHEMICAL NAME	BLENDED PETROLEUM HYDROCARBON

SECTION 2	PHYSICAL DATA
C.A.S. NUMBER:	MIXTURE (SEE DATA BELOW)
BOILING POINT (F):	212^{0}f
SPECIFIC GRAVITY (H20=1):	0.93
MELTING POINT:	N.A. ^{0}f
VAPOR PRESSURE:	17.535 (GAUGE)
PERCENT VOLATILE:	0
VAPOR DENSITY (AIR=1):	N/A
EVAPORATIVE RATE (EE=1):	N/A
SOLUBILITY IN WATER:	SOLUBLE
APPEARANCE AND ODOR:	LIGHT BROWN LIQUID, FAINT PETROLEUM ODOR

COMPONENT NAME/ CAS NO.	% MIN	% MAX	EXPOSURE LIMITS	UNITS

HEAVY PARAFFINIC DISTILLATE SOLVENT EXTRACT (HPDSE)/ 64742-04-7	50	70	OSHA PEL (OIL MIST) 8HR/TWA (OIL MIST)	5 mg/m3 0.2mg/m3
EMULSIFIER/ LISTED IN TSCA	0	10	ORAL LD50 (RATS)	<19g/kg

SECTION 3	FIRE & EXPLOSION DATA
FLASH POINT (^{O}F) & METHOD:	HPDSE: 410 / C.O.C.
FLAMMABILITY LIMITS:	LOWER: N.A. UPPER: N.A.
AUTO IGNITION TEMPERATURE (F):	UNKNOWN

*NA=NOT APPLICABLE **ND=NOT DETERMINED

SECTION 3	FIRE & EXPLOSION DATA
EXTINGUISHING MEDIA	USE DRY CHEMICAL, FOAM OR CARBON DIOXIDE.
SPECIAL FIRE FIGHTING PROCEDURES	WATER MAY BE INEFFECTIVE BUT CAN BE USED TO COOL CONTAINERS EXPOSED TO HEAT OR FLAME. CAUTION SHOULD BE EXERCISED WHEN USING WATER OR FOAM AS FROTHING MAY OCCUR, ESPECIALLY IF SPRAYED INTO CONTAINERS OF HOT, BURNING LIQUID.
UNUSUAL FIRE AND EXPLOSIVE CONDITIONS	DENSE SMOKE MAY BE GENERATED WHILE BURNING. CARBON MONOXIDE, CARBON DIOXIDE AND OTHER OXIDES MAY BE GENERATED AS PRODUCTS OF COMBUSTION.

SECTION 4	REACTIVITY DATA
STABILITY: STABLE	CONDITIONS TO AVOID: NONE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR	
INCOMPATIBILITY MATERIALS TO AVOID:	MAY REACT WITH STRONG OXIDIZING AGENTS
HAZARDOUS DECOMPOSITION PRODUCTS:	NONE

SECTION 5	HEALTH HAZARD DATA
SKIN CONTACT:	AVOID SKIN CONTACT, THIS PRODUCT MAY CAUSE SLIGHT SKIN IRRITATION UPON DIRECT CONTACT; BASED ON TESTING OF SIMILAR PRODUCTS AND/OR COMPONENTS. PROLONGED OR REPEATED CONTACT MAY RESULT IN CONTACT DERMATITIS WHICH MAY MAKE THE SKIN MORE SUSCEPTIBLE TO OTHER IRRITANTS, SENSITIZERS AND DISEASE. PROLONGED OR REPEATED CONTACT MAY RESULT IN OIL ACNE WHICH IS CHARACTERIZED BY BLACKHEADS WITH POSSIBLE SECONDARY INFECTION. CONSTITUENTS OF THIS PRODUCT HAVE BEEN ASSOCIATED WITH PHOTOSENSITIVITY AN ABNORMAL SENSITIVITY OF SKIN TO SUNLIGHT. SEE DATA HEALTH BELOW
EYE CONTACT:	THIS PRODUCT IS RELATIVELY NON-IRRITATING TO THE EYES UPON DIRECT CONTACT BASED ON TESTING OF SIMILAR PRODUCTS AND/OR COMPONENTS.

*NA=NOT APPLICABLE **ND=NOT DETERMINED

SECTION 5	HEALTH HAZARD DATA
INHALATION:	THIS PRODUCT HAS A LOW VAPOR PRESSURE AND IS NOT EXPECTED TO PRESENT AN INHALATION HAZARD AT AMBIENT CONDITION. CAUTION SHOULD BE TAKEN TO PREVENT AEROSOLIZATION OR MISTING OF THIS PRODUCT. THE PERMISSIBLE EXPOSURE LIMIT (PEL) AND THRESHOLD LIMIT VALUE (TLV) FOR THIS PRODUCT AS OIL MIST IS 5 mg/m3 APPEAR TO BE WITHOUT SIGNIFICANT HEALTH RISK. THE SHORT-TERM EXPOSURE LIMIT FOR THIS PRODUCT AS AN OIL MIST IS 10 mg/m3.
INGESTION	DO NOT INGEST. THIS PRODUCT IS RELATIVELY NON- TOXIC BY INGESTION. THIS PRODUCT HAS LAXATIVE PROPERTIES AND MAY RESULT IN ABDOMINAL CRAMPS

	AND DIARRHEA. SEE HEALTH DATA BELOW.
HEALTH DATA	ON RARE OCCASIONS, PROLONGED AND REPEATED EXPOSURE TO OIL MIST POSES A RISK OF PULMONARY DISEASE SUCH AS CHRONIC LUNG INFLAMMATION. THIS CONDITION IS USUALLY ASYMPTOMATIC AS A RESULT OF REPEATED SMALL ASPIRATIONS. SHORTNESS OF BREATH AND COUGH ARE THE MOST COMMON SYMPTOMS. THE PETROLEUM OIL USED FOR THIS PRODUCT IS CLASSIFIED AS CARCINOGENIC BY THE INTERNATIONAL AGENCY FOR RESEARCH OF CANCER. TO MINIMIZE EXPOSURE, DO NOT SUBJECT EMULSION TO TEMPERATURES ABOVE 212°F. TEMPERATURES IN THIS RANGE VOLATILIZE THE EMULSION.

SECTION 6	EMERGENCY AND FIRST AID PROCEDURES
EYE CONTACT	IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER AND CONTINUE FLUSHING UNTIL IRRITATION SUBSIDES. IF MATERIAL IS HOT, TREAT FOR THERMAL BURNS AND TAKE VICTIM TO HOSPITAL IMMEDIATELY.
SKIN CONTACT	REMOVE CONTAMINATED CLOTHING. WASH CONTAMINATED AREA THOROUGHLY WITH SOAP AND WATER. IF REDNESS OR IRRITATION OCCURS, SEEK MEDICAL ATTENTION. IF MATERIAL IS HOT, SUBMERGE INJURED AREA IN COLD WATER. IF VICTIM IS SEVERLEY BURNED, REMOVE TO A HOSPITAL IMMEDIATELY.
INHALATION	THIS MATERIAL HAS A LOW VAPOR PRESSURE AND IS NOT EXPECTED TO PRESENT AN INHALATION EXPOSURE AT AMBIENT CONDITIONS.
INGESTION	DO NOT INDUCE VOMITING. SEEK MEDICAL ATTENTION.

*NA=NOT APPLICABLE **ND=NOT DETERMINED

SECTION 7	PERSONAL HEALTH PROTECTION INFORMATION
EYE PROTECTION	EYE PROTECTION IS NOT REQUIRED UNDER CONDITIONS OF NORMAL USE. IF MATERIAL IS HANDLED SUCH THAT IT COULD BE SPLASHED INTO EYES, WEAR PLASTIC FACE SHIELD OR SPLASH-PROOF SAFETY GOGGLES.
SKIN PROTECTION	NO SKIN PROTECTION IS REQUIRED FOR SINGLE SHORT DURATION EXPOSURES, USE IMPERVIOUS CLOTHING (BOOTS, GLOVES, APRONS, ETC.) OVER PARTS OF THE BODY SUBJECT TO EXPOSURE. IF HANDLING HOT MATERIAL, USE INSULATED PROTECTIVE CLOTHING (BOOTS, GLOVES, APRONS, ETC.) LAUNDER SOILED CLOTHES. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES INCLUDING SHOES, WHICH CANNOT BE DECONTAMINATED.
RESPIRATORY PROTECTION	RESPIRATORY PROTECTION IS NOT REQUIRED UNDER CONDITIONS OF NORMAL USE. IF VAPOR OR MIST IS GENERATED WHEN THE MATERIAL IS HEATED OR HANDLED, USE AN ORGANIC VAPOR RESPIRATOR WITH A DUST AND MIST FILTER. ALL RESPIRATORS MUST BE NIOSH CERTIFIED. DO NOT USE COMPRESSED OXYGEN IN HYDROCARBON ATMOSPHERES.
VENTILATION	IF VAPOR OR MIST IS GENERATED WHEN THE MATERIAL IS HEATED OR HANDLED, ADEQUATE VENTILATION IN ACCORDANCE WITH GOOD ENGINEERING PRACTICE MUST BE PROVIDED TO MAINTAIN CONCENTRATIONS BELOW THE SPECIFIED EXPOSURE OR FLAMMABLE LIMITS.
OTHER	CONSUMPTION OF FOOD AND BEVERAGES SHOULD BE AVOIDED IN WORK AREAS WHERE HYDROCARBONS ARE PRESENT. ALWAYS WASH HANDS AND FACE WITH SOAP AND WATER BEFORE EATING, DRINKING, OR SMOKING.

*NA=NOT APPLICABLE **ND=NOT DETERMINED

SECTION 8	SPILL, LEAK & DISPOSAL PROCEDURES
STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED	CONSULT HEALTH HAZARD DATA IN SECTION 5, PERSONAL HEALTH PROTECTION INFORMATION IN SECTION 7, FIRE & EXPLOSION DATA IN SECTION 3, AND REACTIVITY DATA IN SECTION 4. NOTIFY APPROPRIATE AUTHORITIES OF SPILL. CONTAIN SPILL IMMEDIATELY. DO NOT ALLOW SPILL TO ENTER SEWERS OR WATERCOURSES. REMOVE ALL SOURCES OF IGNITION. ABSORB WITH APPROPRIATE INERT MATERIAL SUCH AS SAND, CLAY, ETC. LARGE SPILLS MAY BE PICKED UP USING VACUUM PUMPS, SHOVELS, BUCKETS OR OTHER MEANS AND PLACED IN DRUMS OR OTHER SUITABLE CONTAINERS.
WASTE DISPOSAL METHOD	ALL DISPOSALS MUST COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS. THE MATERIAL, IF SPILLED OR DISCARDED, MAY BE A REGULATED WASTE. REFER TO STATE AND LOCAL REGULATIONS. CAUTION! IF REGULATED SOLVENTS ARE USED TO CLEAN UP SPILLED MATERIAL, THE RESULTING WASTE MIXTURE MAY BE REGULATED. DEPARTMENT OF TRANSPORTATION (DOT) REGULATIONS MAY APPLY FOR TRANSPORTING THIS MATERIAL WHEN SPILLED. WASTE MATERIAL MAY BE LANDFILLED OR INCINERATED AT AN APPROVED FACILITY. MATERIALS SHOULD BE RECYCLED IF POSSIBLE.

SECTION 9	SPECIAL PRECAUTIONS/ADDITIONAL INFORMATION
HANDLING AND STORAGE REQUIREMENTS	DO NOT TRANSFER TO UNMARKED CONTAINERS. STORE IN CLOSED CONTAINERS AWAY FROM HEAT, SPARKS, OPEN FLAME, OR OXIDIZING MATERIALS. THIS PRODUCT IS NOT CLASSIFIED AS HAZARDOUS UNDER DOT REGULATIONS. FIRE EXTINGUISHERS SHOULD BE KEPT READILY AVAILABLE. SEE NFPA 30 AND OSHA 1910.106 FLAMMABLE AND COMBUSTIBLE LIQUIDS.
ADDITIONAL INFORMATION	THIS PRODUCT IS NOT KNOWN TO CONTAIN ANY SARA TITLE III, SECTION 313 REPORTABLE CHEMICALS, AT OR GREATER THAN 1.0% (0.1% FOR CARCINOGENS) A COMPONENT OF THIS PRODUCT IS ON THE TOXIC SUBSTANCES CONTROL ACT (TSCA) INVENTORY.

*NA=NOT APPLICABLE **ND=NOT DETERMINED

CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

1,1,1-TRICHLOROETHANE

The information in this document is compiled from information maintained by the United States Department of Defense (DOD). Anyone using this information is solely reponsible for the accuracy and applicability of this information to a particular use or situation.
Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
1,1,1-TRICHLOROETHANE

Product Identification: 1,1,1-TRICHLOROETHANE
Date of MSDS: 01/01/1987 **Technical Review Date:** 05/22/1999
FSC: 6810 **NIIN:** 00-476-5612
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: PHIPPS PRODUCTS CORP

Manufacturer's Address1: 186 LINCOLN ST SUITE 502
Manufacturer's Address2: BOSTON, MA 02111-2403
Manufacturer's Country: US
General Information Telephone:
Emergency Telephone: 617-542-7341
Emergency Telephone: 617-542-7341
MSDS Preparer's Name: DGSC-SSH
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 86511
Special Project Code: N

Item Description

Item Name: TRICHLOROETHANE,TECHNICAL
Item Manager: S9G
Specification Number: MIL-T-81533A
Type/Grade/Class: NONE
Unit of Issue: CN **Quantitative Expression:** 00000000005GL
Unit of Issue Quantity: 0
Type of Container: CAN

Contractor Information

Contractor's Name: PHIPPS PRODUCTS CORP
Contractor's Address1: 186 LINCOLN ST SUITE 502
Contractor's Address2: BOSTON, MA 02111-2403
Contractor's Telephone: OUT OF BUSINESS
Contractor's CAGE: 86511

Section 2 - Compositon/Information on Ingredients
1,1,1-TRICHLOROETHANE

Ingredient Name: METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE) (SARA III)
Ingredient CAS Number: 71-55-6 **Ingredient CAS Code:** M
RTECS Number: KJ2975000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: 350 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 350 PPM/450STEL;9394 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**

EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: 1

Section 3 - Hazards Identification, Including Emergency Overview
1,1,1-TRICHLOROETHANE

Health Hazards Acute & Chronic: ACUTE: MAY CAUSE EYE & SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. CENTRAL NERVOUS SYSTEM DEPRESSANT. LOSS OF CONSCIOUSNESS AND EVEN DEATH CAN OCCUR AT HIGH LEVELS OF EXPOSURE.

Signs & Symptoms of Overexposure:
INCOORDINATION AND IMPAIRED JUDGMENT MAY OCCUR AT VAPOR EXPOSURES FROM 500-1000 PPM. DIZZINESS, DROWSINESS, AND GENERAL ANESTETHIC EFFECTS MAY OCCUR IN RANGES OF 1000 PPM AND HIGHER.

Medical Conditions Aggravated by Exposure:
INCREASED SENSITIVITY TO ADRENALINE MAY BE CAUSED BY OVER EXPOSURE.

LD50 LC50 Mixture: ORAL LD50 (RAT) = 10300 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT LISTED AS A CARCINOGEN BY NTP, IARC OR OSHA

Section 4 - First Aid Measures
1,1,1-TRICHLOROETHANE

First Aid:
INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE CPR. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN. EYE: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES. GET MEDICAL AT TENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER PROMPTLY. INGESTION: DO NOT INDUCE VOMITING. GIVE MILK OR USP MINERAL OIL. GET IMMEDIATE MEDICAL ATTENTION.

Section 5 - Fire Fighting Measures
1,1,1-TRICHLOROETHANE

Fire Fighting Procedures:
WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire or Explosion Hazard:

COMBUSTION OR HEAT OF FIRE MAY PRODUCE HIGHLY TOXIC AND IRRITATING FUMES.

Extinguishing Media:
USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.

Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: 998F
Lower Limit(s): 8.0
Upper Limit(s): 10.5

Section 6 - Accidental Release Measures
1,1,1-TRICHLOROETHANE

Spill Release Procedures:
SMALL SPILL: WIPE UP WITH RAGS OR TOWELS. LARGE SPILLS: WEAR NIOSH APPROVED RESPIRATOR. VENTILATE AREA. DIKE TO RETAIN FLUID. PUMP UP FREE LIQUID. RESIDUE WILL EVAPORATE QUICKLY. DO NOT FLUSH TO SEWER OR WATERWAY.

Section 7 - Handling and Storage
1,1,1-TRICHLOROETHANE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
1,1,1-TRICHLOROETHANE

Repiratory Protection:
IN HIGH VAPOR AREA, USE NIOSH/MSHA APPROVED RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE. USE SELF-CONTAINED BREATHING APPARATUS IF VAPOR LEVELS EXCEED 1000 PPM.

Ventilation:
LOCAL EXHAUST RECOMMENDED TO CONTROL VAPORS BELOW 50% OF TLV.

Protective Gloves:
NEOPRENE, PVA GLOVES RECOMMENDED.

Eye Protection: USE CHEMICAL SAFETY GOGGLES.

Other Protective Equipment: APRON AND WORK CLOTHING TO MINIMIZE EXPOSURE. EYE WASH STATION & SAFETY SHOWER RECOMMENDED.

Work Hygenic Practices: WASH THOROUGHLY AFTER USE AND BEFORE EATING, SMOKING OR USING TOILET FACILITIES. DO NOT BREATH VAPORS OR MIST.

Supplemental Health & Safety Information: TARGET ORGANS ARE SKIN, CNS, CVS, AND EYES

Section 9 - Physical & Chemical Properties
1,1,1-TRICHLOROETHANE

HCC: T4
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R

Boiling Point: =73.9C, 165.F **Boiling Point Text:**
Melting/Freezing Point: Melting/Freezing Text: NONE
Decomposition Point: Decomposition Text: UNKNOWN
Vapor Pressure: 100 **Vapor Density:** 4.58
Percent Volatile Organic Content:
Specific Gravity: 1.34
Volatile Organic Content Pounds per Gallon:
pH: N/R
Volatile Organic Content Grams per Liter:
Viscosity: UNKNOWN
Evaporation Weight and Reference: 6.0 (N-BUTYL ACETATE=1)
Solubility in Water: SLIGHT
Appearance and Odor: CLEAR, COLORLESS LIQUID. MILD, CHLOROFORM-LIKE ODOR.
Percent Volatiles by Volume: 100
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
1,1,1-TRICHLOROETHANE

Stability Indicator: YES
Materials to Avoid:
STRONG CAUSTICS; STRONG OXIDIZING AGENTS; CHEMICALL-ACTIVE METALS SUCH AS ZINC, ALUMINUM, MAGNESIUM POWDERS, ETC.
Stability Condition to Avoid:
HIGH HEAT, OPEN FLAMES AND OTHER SOURCES OF IGNITION
Hazardous Decomposition Products:
WHEN INVOLVED IN FIRE, 1,1,1-TRICHLOROETHANE EMITS HIGHLY TOXIC AND IRRITATING HYDROGEN CHLORIDE AND PHOSGENE FUMES.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
1,1,1-TRICHLOROETHANE

Toxicological Information:
N/P

Section 12 - Ecological Information
1,1,1-TRICHLOROETHANE

Ecological Information:
N/P

Section 13 - Disposal Considerations
1,1,1-TRICHLOROETHANE

Waste Disposal Methods:
DISPOSE OF I/A/W FEDERAL, STATE & LOCAL REGULATIONS

Section 14 - MSDS Transport Information
1,1,1-TRICHLOROETHANE

Transport Information:
N/P

Section 15 - Regulatory Information
1,1,1-TRICHLOROETHANE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
1,1,1-TRICHLOROETHANE

Other Information:
N/P

HMIS Transportation Information

Product Identification: 1,1,1-TRICHLOROETHANE
Transporation ID Number: 73134
Responsible Party CAGE: 86511
Date MSDS Prepared: 01/01/1987
Date MSDS Reviewed: 07/25/1991
MFN: 07/25/1991
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** CN
- **Container Quantity:** 0
- **Type of Container:** CAN
- **Net Unit Weight:** 55.9 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity: N/R
Form:
Net Explosive Weight: N/R
Coast Guard Ammunition Code: N/R
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number: N/R
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
NONE

Department of Transportation Information

DOT Proper Shipping Name: 1,1,1-$TRICHLOROETHANE
DOT PSN Code: OQD
Symbols:
DOT PSN Modifier:

Hazard Class: 6.1
UN ID Number: UN2831
DOT Packaging Group: III
Label: KEEP AWAY FROM FOOD
Special Provision(s): N36,T7
Packaging Exception: 153
Non Bulk Packaging: 203
Bulk Packaging: 241
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: 1,1,1-$TRICHLOROETHANE
IMO PSN Code: OVK
IMO PSN Modifier:
IMDG Page Number: 6272-1
UN Number: 2831
UN Hazard Class: 6.1
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 6.1-02
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: 1,1,1-$TRICHLOROETHANE
IATA PSN Code: YLY
IATA PSN Modifier:
IATA UN Id Number: 2831
IATA UN Class: 6.1
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: TOXIC
Packaging Note for Passengers: 605
Maximum Quantity for Passengers: 60 L
Packaging Note for Cargo: 612
Maximum Quantity for Cargo: 220 L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: 1,1,1-$TRICHLOROETHANE
AFI Symbols:
AFI PSN Code: YLY
AFI PSN Modifier:
AFI UN Id Number: UN2831
AFI Hazard Class: 6.1
AFI Packing Group: III
AFI Label:
Special Provisions: P5, N36
Back Pack Reference: A10.5

HAZCOM Label Information

Product Identification: 1,1,1-TRICHLOROETHANE
CAGE: 86511
Assigned Individual: N
Company Name: PHIPPS PRODUCTS CORP
Company PO Box:

1,1,1-TRICHLOROETHANE

Company Street Address1: 186 LINCOLN ST SUITE 502
Company Street Address2: BOSTON, MA 02111-2403 US
Health Emergency Telephone: 617-542-7341
Label Required Indicator: Y
Date Label Reviewed: 07/25/1991
Status Code: C
Manufacturer's Label Number: NOT APPLICABLE
Date of Label: 07/25/1991
Year Procured: 1984
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Slight
Reactivity Hazard: None

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

1,1,2-TRICHLOROETHANE

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
1,1,2-TRICHLOROETHANE

Product Identification: 1,1,2-TRICHLOROETHANE
Date of MSDS: 08/22/1996 **Technical Review Date:** 01/12/1998
FSC: 6810 **NIIN:** **LIIN:** 00N082083
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: FISHER SCIENTIFIC

Manufacturer's Address1: 1 REAGENT LANE
Manufacturer's Address2: FAIR LAWN, NJ 07410
Manufacturer's Country: US
General Information Telephone: 201-796-7100
Emergency Telephone: 201-796-7100;800-424-9300(CHEMTREC)
Emergency Telephone: 201-796-7100;800-424-9300(CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 1B464
Special Project Code: N

Contractor Information

Contractor's Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Contractor's Address1: 1 REAGENT LANE
Contractor's Address2: FAIR LAWN, NJ 07410-2802
Contractor's Telephone: 201-796-7100
Contractor's CAGE: 1B464

Section 2 - Compositon/Information on Ingredients
1,1,2-TRICHLOROETHANE

Ingredient Name: ETHANE, 1,1,2-TRICHLORO-; (1,1,2-TRICHLOROETHANE) (SARA 313) (CERCLA)
Ingredient CAS Number: 79-00-5 **Ingredient CAS Code:** M
RTECS Number: KJ3150000 **RTECS Code:** M
=WT: **=WT Code:**
=Volume: **=Volume Code:**
>WT: **>WT Code:**
>Volume: **>Volume Code:**
<WT: **<WT Code:**
<Volume: **<Volume Code:**
% Low WT: **% Low WT Code:**
% High WT: **% High WT Code:**
% Low Volume: **% Low Volume Code:**
% High Volume: **% High Volume Code:**
% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 10 PPM, S **OSHA PEL Code:** M
OSHA STEL: **OSHA STEL Code:**
ACGIH TLV: 10 PPM, S **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
1,1,2-TRICHLOROETHANE

Health Hazards Acute & Chronic: ACUTE: EYES: MAY CAUSE IRRIT, INJURY. SKIN: MAY

CAUSE IRRIT W/REDNESS, DRYNESS, & INFLAMM. INGEST: ASPIR HAZ. MAY CAUSE GI IRRIT W/NAUS, VOMIT, & DIARR. MAY CAUSE CNS DEPRESS W/EXCITEMENT, FOLLOWED BY HDCH, DIZZ, DROW, & NAUS. ADVANCED STAGES MAY CAUSE COLLAPSE, UNCON, COMA, & POSS DEATH DUE TO RESP (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ: FAILURE. ASPIR OF MATL INTO LUNGS MAY CAUSE CHEM PNEUMIT, WHICH MAY BE FATAL. MAY BE HARMFUL IF SWALLOWED. INHAL: HIGH CONCS MAY CAUSE CNS EFTS W/HDCH, DIZZ, UNCON, & COMA. CAUSES RESP TRACT IRRIT. CHRONIC: MAY CAUSE LIVER & KIDNEY DAMAGE.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: LD50 (ORAL RAT): 836 MG/KG.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
1,1,2-TRICHLOROETHANE

First Aid:
EYES: FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MIN, OCCAS LIFTING UPPER & LOWER LIDS. GET MED AID IMMED. SKIN: GET MED AID. FLUSH SKIN W/PLENTY OF SOAP & WATER FOR AT LEAST 15 MIN WHILE REMOVING CONTAM CLTHG & SHOES. INGEST: IF CONSCIOUS & ALERT, GIVE 2-4 CUPFULS OF MILK/WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCON PERS. GET MED AID IMMED. INHAL: GET MED AID IMMED. REMOVE TO FRESH AIR (SUP DAT)

Section 5 - Fire Fighting Measures
1,1,2-TRICHLOROETHANE

Fire Fighting Procedures:
WEAR NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NONE SPECIFIED BY MANUFACTURER.
Extinguishing Media:
USE MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 8.4%
Upper Limit(s): 13.3%

Section 6 - Accidental Release Measures
1,1,2-TRICHLOROETHANE

Spill Release Procedures:
ABSORB SPILL WITH INERT MATERIALS (E.G., DRY SAND OR EARTH), THEN PLACE INTO A CHEMICAL WASTE CONTAINER. CLEAN UP SPILLS IMMEDIATELY, OBSERVING PRECAUTIONS IN THE PROTECTIVE EQUIPMENT SECTION.

Section 7 - Handling and Storage
1,1,2-TRICHLOROETHANE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
1,1,2-TRICHLOROETHANE

Repiratory Protection:
FOLLOW THE OSHA RESPIRATOR REGULATIONS FOUND IN 29CFR 1910.134. ALWAYS USE A NIOSH APPROVED RESPIRATOR WHEN NECESSARY.
Ventilation:
USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP AIRBORNE CONCENTRATIONS BELOW THE PERMISSIBLE EXPOSURE LIMITS.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPROVED EMERGENCY EYEWASH & DELUGE SHOWER (FP N). WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT SKIN EXPOSURE.
Work Hygenic Practices: WASH THOROUGHLY AFTER HANDLING. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE.
Supplemental Health & Safety Information: FIRST AID PROC: IMMED. IF NOT BRTHG, GIVE ARTF RESP. IF BRTHG IS DFCLT, GIVE OXYGEN. NOTES TO MD: TREAT SYMPTOMATICALLY & SUPPORTIVELY.

Section 9 - Physical & Chemical Properties
1,1,2-TRICHLOROETHANE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: >110F,>43C
Melting/Freezing Point: Melting/Freezing Text: -34F,-37C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 25MBAR@25C **Vapor Density:** 4.63
Percent Volatile Organic Content:
Specific Gravity: 1.435
Volatile Organic Content Pounds per Gallon:
pH: N/A
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K

Solubility in Water: ALMOST INSOLUBLE
Appearance and Odor: CLEAR, SLIGHTLY YELLOW LIQUID; SWEET, SLIGHTLY IRRITATING ODOR
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
1,1,2-TRICHLOROETHANE

Stability Indicator: YES
Materials to Avoid:
STRONG BASES, STRONG OXIDIZING AGENTS, SODIUM, POTASSIUM, MAGNESIUM, ALUMINUM, HEAT.
Stability Condition to Avoid:
INCOMPATIBLE MATERIALS.
Hazardous Decomposition Products:
HYDROGEN CHLORIDE, PHOSGENE, CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
1,1,2-TRICHLOROETHANE

Toxicological Information:
N/P

Section 12 - Ecological Information
1,1,2-TRICHLOROETHANE

Ecological Information:
N/P

Section 13 - Disposal Considerations
1,1,2-TRICHLOROETHANE

Waste Disposal Methods:
DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE, AND LOCAL REGULATIONS. RCRA U-SERIES: WASTE NUMBER U227. THIS MATERIAL IS BANNED FROM LAND DISPOSAL ACCORDING TO RCRA.

Section 14 - MSDS Transport Information
1,1,2-TRICHLOROETHANE

Transport Information:
N/P

Section 15 - Regulatory Information
1,1,2-TRICHLOROETHANE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:

N/P

Section 16 - Other Information
1,1,2-TRICHLOROETHANE

Other Information:
N/P

HAZCOM Label Information

Product Identification: 1,1,2-TRICHLOROETHANE
CAGE: 1B464
Assigned Individual: N
Company Name: FISHER SCIENTIFIC CO. CHEMICAL MFG DIV
Company PO Box:
Company Street Address1: 1 REAGENT LANE
Company Street Address2: FAIR LAWN, NJ 07410-2802 US
Health Emergency Telephone: 201-796-7100;800-424-9300(CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 01/12/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 01/12/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Severe
Contact Hazard: Moderate
Fire Hazard: None
Reactivity Hazard: Slight

8/9/2002 10:13:07 AM

MSDS Number: **T4940** * * * * * *Effective Date: 08/01/05* * * * * * *Supercedes: 05/08/03*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

TRICHLOROETHYLENE

1. Product Identification

Synonyms: Trichloroethene; TCE; acetylene trichloride; Ethinyl trichloride
CAS No.: 79-01-6
Molecular Weight: 131.39
Chemical Formula: C2HCl3
Product Codes:
J.T. Baker: 5376, 9454, 9458, 9464, 9473
Mallinckrodt: 8600, 8633

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Trichloroethylene	79-01-6	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN

IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Poison)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Vapors can irritate the respiratory tract. Causes depression of the central nervous system with symptoms of visual disturbances and mental confusion, incoordination, headache, nausea, euphoria, and dizziness. Inhalation of high concentrations could cause unconsciousness, heart effects, liver effects, kidney effects, and death.
Ingestion:
Cases irritation to gastrointestinal tract. May also cause effects similar to inhalation. May cause coughing, abdominal pain, diarrhea, dizziness, pulmonary edema, unconsciousness. Kidney failure can result in severe cases. Estimated fatal dose is 3-5 ml/kg.
Skin Contact:
Cause irritation, redness and pain. Can cause blistering. Continued skin contact has a defatting action and can produce rough, dry, red skin resulting in secondary infection.
Eye Contact:
Vapors may cause severe irritation with redness and pain. Splashes may cause eye damage.
Chronic Exposure:
Chronic exposures may cause liver, kidney, central nervous system, and peripheral nervous system effects. Workers chronically exposed may exhibit central nervous system depression, intolerance to alcohol, and increased cardiac output. This material is linked to mutagenic effects in humans. This material is also a suspect carcinogen.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders, cardiovascular disorders, impaired liver or kidney or respiratory function, or central or peripheral nervous system disorders may be more susceptible to the effects of the substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.
Skin Contact:

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

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5. Fire Fighting Measures

Fire:
Autoignition temperature: 420C (788F)
Flammable limits in air % by volume:
lel: 8; uel: 12.5

Explosion:
A strong ignition source, e. g., a welding torch, can produce ignition. Sealed containers may rupture when heated.

Fire Extinguishing Media:
Use water spray to keep fire exposed containers cool. If substance does ignite, use CO2, dry chemical or foam.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

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6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible

substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Trichloroethylene:
-OSHA Permissible Exposure Limit (PEL):
100 ppm (TWA), 200 ppm (Ceiling),
300 ppm/5min/2hr (Max)

-ACGIH Threshold Limit Value (TLV):
50 ppm (TWA) 100 ppm (STEL);
listed as A5, not suspected as a human carcinogen.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.

Odor:
Chloroform-like odor.

Solubility:
Practically insoluble in water. Readily miscible in organic solvents.

Specific Gravity:
1.47 @ 20C/4C

pH:

No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
87C (189F)
Melting Point:
-73C (-99F)
Vapor Density (Air=1):
4.5
Vapor Pressure (mm Hg):
57.8 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Will slowly decompose to hydrochloric acid when exposed to light and moisture.
Hazardous Decomposition Products:
May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong caustics and alkalis, strong oxidizers, chemically active metals, such as barium, lithium, sodium, magnesium, titanium and beryllium, liquid oxygen.
Conditions to Avoid:
Heat, flame, ignition sources, light, moisture, incompatibles

---

11. Toxicological Information

Toxicological Data:
Trichloroethylene: Oral rat LD50: 5650 mg/kg; investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
This material has been linked to mutagenic effects in humans.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Trichloroethylene (79-01-6)	No	Yes	2A

---

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.
Environmental Toxicity:
The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be slightly toxic to aquatic life.

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13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 4L

International (Water, I.M.O.)

Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1
UN/NA: UN1710
Packing Group: III
Information reported for product/size: 4L

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Trichloroethylene (79-01-6)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Trichloroethylene (79-01-6)	Yes	Yes	No	Yes

\Federal, State & International Regulations - Part 1\

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Trichloroethylene (79-01-6)	No	No	Yes	No

\Federal, State & International Regulations - Part 2\

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Trichloroethylene (79-01-6)	100	U228	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **2** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat and flame.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.

Note to physician: Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

Product Use:
Laboratory Reagent.

Revision Information:
MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:
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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

VINYL CHLORIDE

The information in this document is compiled from information maintained by the United States Department of Defense (DOD). Anyone using this information is solely reponsible for the accuracy and applicability of this information to a particular use or situation.
Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
VINYL CHLORIDE

Product Identification: VINYL CHLORIDE
Date of MSDS: 10/01/1985 **Technical Review Date:** 10/09/1992
FSC: 6810 **NIIN:** **LIIN:** 00N034925
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: MATHESON GAS PRODUCTS

Manufacturer's Address1: 932 PATTERSON PLANK RD
Manufacturer's Address2: EAST RUTHERFORD, NJ 07073
Manufacturer's Country: US
General Information Telephone: 201-933-2400
Emergency Telephone: 201-933-2400
Emergency Telephone: 201-933-2400
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0FB11
Special Project Code: N

Contractor Information

Contractor's Name: MATHESON GAS PRODUCTS
Contractor's Address1: 30 SEAFIEW DRIVE
Contractor's Address2: SEACAUCUS, NJ 07096
Contractor's Telephone: 201-867-4100, CHEMTREC 800-424-9300
Contractor's CAGE: 0FB11

Section 2 - Compositon/Information on Ingredients
VINYL CHLORIDE

Ingredient Name: ETHYLENEM, CHLORO-; (VINYL CHLORIDE) (SARA III)
Ingredient CAS Number: 75-01-4 **Ingredient CAS Code:** M
RTECS Number: KU9625000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: SEE 1910.1017 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 PPM, A1; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
VINYL CHLORIDE

Health Hazards Acute & Chronic: ACUTE:INHAL MAY CAUSE DROWS, BLURRED VISION, STAG GAIT, & TINGLING & NUMBNESS IN THE FEET & HANDS. IN HIGH CONC VINYL

CHLORIDE ACTS AS AN ANESTHETIC. CONTACT WITH LIQ VINYL CHLORIDE MAY CAUSE SEVERE I RRITATION & BURNS. CHRONIC: VINYL CHLORIDE IS A RECOGNIZED CARCINOGEN & HAS CAUSED CANCER IN MAN.(EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: YES

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: YES

Carcinogenicity Explanation: VINYL CHLORIDE: KNOWN CARCINOGEN (NTP), GROUP 1 (IARC); OSHA REGULATED

Section 4 - First Aid Measures
VINYL CHLORIDE

First Aid:
INHAL: MOVE VICTIM TO FRESH AIR. IF NOT BRTHG, GIVE ARTF RESP. IF BRTHG IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN. EYE/SKIN: IMMED FLUSH EYE/SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MIN. REMOVE CON TAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN. INGEST: GET MD IMMEDIATELY (FP N). NOTE: SKIN BURNS CAN BE TREATED BY THE APPLICATION OF MAGNESIUM PASTE (MAGNESIUM OXIDE AND GLYCERINE).

Section 5 - Fire Fighting Measures
VINYL CHLORIDE

Fire Fighting Procedures:
FIRE FIGHTERS MUST WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). FIREIGHTERS TURNOUT GEAR IS INADEQUATE.
Unusual Fire or Explosion Hazard:
CYLINDERS THAT ARE EXPOSED TO FIRE MAY RUPTURE WITH VIOLENT FORCE. EXTING SURROUNDING FIRE & KEEP CYLINDERS COOL USING A WATER SPRAY APPLIED FROM THE(SUPP DATA)
Extinguishing Media:
TO EXTING A VINYL CHLORIDE FIRE STOP THE FLOW OF GAS. IF THE FLOW CANNOT BE STOPPED, LET THE FIRE BURN ITSELF(SUPP DATA)
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 4%

Upper Limit(s): 22%

Section 6 - Accidental Release Measures
VINYL CHLORIDE

Spill Release Procedures:
EVACUATE AREA. PERSONNEL EQUIPPED W/SPECIAL PERSONAL PROTECTIVE SUITS FOR FIRE/CHEMICALS AND POSITIVE PRESSURE NIOSH/MSHA APPROVED SCBA CAN RE-ENTER THE AREA AND ATTEMPT TO STOP LEAK.

Section 7 - Handling and Storage
VINYL CHLORIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
VINYL CHLORIDE

Repiratory Protection:
NIOSH/MSHA APPROVED POSITIVE PRESSURE SCBA SHOULD BE WORN IF IT IS SUSPECTED THAT VINYL CHLORIDE IS IN THE AIR.
Ventilation:
NONE SPECIFIED BY MANUFACTURER.
Protective Gloves:
IMPERVIOUS GLOVES.
Eye Protection: CHEM WORK GOGG/FULL LENGTH FSHLD (FP N).
Other Protective Equipment: EYE WASH STATIONS & SAFETY SHOWERS READILY AVAILABE.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EXTING MEDIA:OUT WHILE COOLING CYLINDER & SURROUNDINGS USING A H*2O SPRAY. EXPLO HAZ:MAX POSS DISTANCE. FLAMM & TOX GASES MAY SPREAD FROM A SPILL AFTER FIRE IS EXTING & BE SUBJECT TO REIGNIT. THERMAL DECOMP PRODS MAY INCL HCL & PHOSGENE (FP N). OTHER PREC: PLAN COVERING STEPS TO BE TAKEN IN CASE OF ACCIDENTAL RELEASE.

Section 9 - Physical & Chemical Properties
VINYL CHLORIDE

HCC: G2
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 7.2F,-13.8C
Melting/Freezing Point: Melting/Freezing Text: -245F,-154C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 234KPA@21C **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 2.21
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:

Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: 1.07 CM3/1 ML H*2O
Appearance and Odor: COLORLESS, HIGHLY FLAMM GAS WITH A PLEASANT, SWEET ODOR AT HIGH CONC.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
VINYL CHLORIDE

Stability Indicator: YES
Materials to Avoid:
OXIDIZING MATLS, ACTIVE METALS, ALUMINUM ALLOYS AND ORGANOMETALLICS.
Stability Condition to Avoid:
AVOID EXPOSURE TO SUNLIGHT, HEAT, AIR, OXYGEN PEROXIDES AND OTHER STRONG OXIDIZING AGENTS.
Hazardous Decomposition Products:
HYDROGEN CHLORIDE, PHOSGENE, CARBON MONOXIDE.
Hazardous Polymerization Indicator: YES
Conditions to Avoid Polymerization:
OXYGEN (AIR), HEAT, SUNLIGHT, MOISTURE AND FREE RADICAL INITIATORS OR OTHER CATALYTIC MATERIALS.

Section 11 - Toxicological Information
VINYL CHLORIDE

Toxicological Information:
N/P

Section 12 - Ecological Information
VINYL CHLORIDE

Ecological Information:
N/P

Section 13 - Disposal Considerations
VINYL CHLORIDE

Waste Disposal Methods:
DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (FP N).

Section 14 - MSDS Transport Information
VINYL CHLORIDE

Transport Information:
N/P

Section 15 - Regulatory Information
VINYL CHLORIDE

SARA Title III Information:
N/P
Federal Regulatory Information:

N/P
State Regulatory Information:
N/P

Section 16 - Other Information
VINYL CHLORIDE

Other Information:
N/P

HMIS Transportation Information

Product Identification: VINYL CHLORIDE
Transporation ID Number: 39375
Responsible Party CAGE: 0FB11
Date MSDS Prepared: 10/01/1985
Date MSDS Reviewed: 03/24/1993
MFN: 03/24/1993
Submitter: N TN
Status Code: C

Container Information
- **Unit of Issue:** NK
- **Container Quantity:** NK
- **Type of Container:**
- **Net Unit Weight:**

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: VINYL CHLORIDE, INHIBITED OR VINYL CHLORIDE, STABILIZED
DOT PSN Code: PRS
Symbols:
DOT PSN Modifier:
Hazard Class: 2.1
UN ID Number: UN1086
DOT Packaging Group:
Label: FLAMMABLE GAS
Special Provision(s): 21,B44
Packaging Exception: 306

Non Bulk Packaging: 304
Bulk Packaging: 314,315
Maximimum Quanity in Passenger Area: FORBIDDEN
Maximimum Quanity in Cargo Area: 150 KG
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: VINYL CHLORIDE, INHIBITED
IMO PSN Code: PJJ
IMO PSN Modifier:
IMDG Page Number: 2186
UN Number: 1086
UN Hazard Class: 2(2.1)
IMO Packaging Group: -
Subsidiary Risk Label: -
EMS Number: 2-07
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: VINYL CHLORIDE, INHIBITED
IATA PSN Code: ZHW
IATA PSN Modifier:
IATA UN Id Number: 1086
IATA UN Class: 2.1
Subsidiary Risk Class:
UN Packaging Group:
IATA Label: FLAMMABLE GAS
Packaging Note for Passengers: FORB
Maximum Quantity for Passengers: FORB
Packaging Note for Cargo: 200
Maximum Quantity for Cargo: 150KG
Exceptions: A1

AFI Detail Information

AFI Proper Shipping Name: VINYL CHLORIDE, INHIBITED
AFI Symbols:
AFI PSN Code: ZHW
AFI PSN Modifier:
AFI UN Id Number: UN1086
AFI Hazard Class: 2.1
AFI Packing Group: N/A
AFI Label:
Special Provisions: P4
Back Pack Reference: A6.3, A6.5

HAZCOM Label Information

Product Identification: VINYL CHLORIDE
CAGE: 0FB11
Assigned Individual: N
Company Name: MATHESON GAS PRODUCTS
Company PO Box:
Company Street Address1: 30 SEAFIEW DRIVE
Company Street Address2: SEACAUCUS, NJ 07096 US
Health Emergency Telephone: 201-933-2400
Label Required Indicator: Y
Date Label Reviewed: 10/08/1992
Status Code: C

Manufacturer's Label Number:
Date of Label: 10/08/1992
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: Severe
Reactivity Hazard: Slight

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ATTACHMENT 10
SUBCONTRACTOR'S HEALTH AND SAFETY PLAN

(<u>Instructions to Project Manager and Subcontractor</u>: Please ensure that all subcontractors provide their own site-specific HASP for their portion of the work. This should be attached behind this page so that it blends smoothly with the SECOR portion of the HASP. The subcontractor's HASP must be site-specific and discuss all of the hazards to which their employees may be exposed, and the appropriate means they will follow to avoid the exposure to the extent possible. SECOR's HASP can be used as a guide for developing the subcontractor's HASP, but cannot be used exclusively since the subcontractor's employees may face exposures and risks not covered by the SECOR HASP.

Subcontractors must understand that our team goal is zero incidents of all types. If the subcontractor has any questions, he/she may contact Philip Platcow, SECOR's Director of Health and Safety at (617) 232-7355 for guidance and direction. Cooperation on this requirement is greatly appreciated.)

ATTACHMENT 11

DAILY PRODUCTION HEALTH & SAFETY BRIEFING

ATTACHMENT 11

DAILY PRODUCTION HEALTH AND SAFETY BRIEFING LOG

Date:	
Start Time:	
Issues Discussed:	
1.	**6.**
2.	**7.**
3.	**8.**
4.	**9.**
5.	**10.**
Attendees	
Print Name and Company	**Signature**
Meeting Conducted by:	**Signature:**
Name (Site Health and Safety Coordinator):	**Signature:**

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DAILY PRODUCTION HEALTH AND SAFETY BRIEFING LOG

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Attendees	
Print Name and Company	**Signature**
Meeting Conducted by:	**Signature:**
Name (Site Health and Safety Coordinator):	**Signature:**

DISCUSSION IDEAS FOR THE DAILY PRODUCTION H&S MEETING

- Emergency response plan, emergency vehicle (full of fuel) and muster point
- Route to medical aid (hospital or other facility)
- Work hours, is night work planned?
- Hand signals around heavy equipment
- Traffic control
- Pertinent Legislation and Regulations
- Above and below ground utilities (energized or de-energized)
- Material Safety Data Sheets (MSDS)
- To who, what, why, and when to report an incident
- Fire extinguisher and first aid kit locations
- Excavations, trenching sloping and shoring
- Personal protective equipment (PPE) and training
- Safety equipment and training
- Emergency telephone and telephone numbers (may not be 911)
- Eye wash stations and washroom locations
- Energy lock-out/tag-out procedures. Location of “kill Switches” etc.
- Weather restrictions
- Site security. Site hazards. Is special waste present.
- Traffic and people movements
- Working around machinery (both static and mobile)
- Sources of ignition, static electricity etc.
- Stings, bites, large animals and other naturally related injuries
- Working above grade
- Working at isolated sites
- Decontamination procedures (both personnel and equipment)
- Falls, trips, sprains and lifting injuries (how to prevent)
- Right to refuse unsafe work
- Adjacent property issues (residence, business, school, day care center)

ATTACHMENT 12
HEALTH AND SAFETY PLAN
ACKNOWLEDGEMENT AND AGREEMENT FORM

ATTACHMENT 12
HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT AND AGREEMENT FORM
(All SECOR and subcontractor personnel must sign.)

"Zero Tolerance for Incident of ANY Kind. Work Together to Ensure A SAFE and High Quality Project

This Health and Safety Plan has been developed for the purpose of informing SECOR employees of the hazards they are likely to encounter on the project site, and the precautions they should take to avoid those hazards. Sub-contractors and other contractors at the site must develop their own Health and Safety Plan to address the hazards faced by their own employees. SECOR has provided a copy of this Plan to contractors in the interest of full disclosure of hazards of which we may be aware, and to satisfy SECOR's responsibilities under the Occupational Safety and Health Administration (OSHA) Hazard Communication standard. Similarly, contractors are required to inform SECOR of any hazards of which they are aware or that the contractor's work on site might possibly pose to SECOR employees, including (but not limited to) the Material Safety Data Sheets for chemicals the contractor may bring on-site. This plan should NOT be understood by contractors to provide information on all of the hazards to which a contractor's employees may be exposed as a result of their work.

I further certify that I have received training and medical surveillance according to the Health and Safety Plan and the OSHA Standard on Hazardous Waste Operations and Emergency Response (29 CFR 1910.120):

All parties conducting site activities are required to coordinate their activities and practices with the project Site Health and Safety Officer. Your signature below confirms that you have read and understand the hazards discussed in this Plan, and understand that sub-contractors and contractors must develop their own Health and Safety Plan for their employees. You also understand you could be prohibited by the Site Health and Safety Officer or other SECOR personnel from working on this project for not complying with any aspect of this Health and Safety Plan.

Name	Title	Signature	Company	Date

Name	Title	Signature	Company	Date